Wide Awake Evaluation Report

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Executive Summary

Achievements

- Identified engagement & complexity as cause of fatigue
- Identified & validated wait time as a key cause of fatigue
- Developed and tested an intervention tool
- Identified & tested leadership strategies for addressing wait time
- Established a tool & engagement process to handover to industry

THE WIDE AWAKE PROJECT

About This Project

Project Wide Awake, funded by Australia's National Heavy Vehicle Regulator (NHVR) through the Heavy Vehicle Safety Initiative (HVSI), aimed to address the persistent issue of driver fatigue in the heavy vehicle industry. Despite existing regulations and fatigue management protocols, driver fatigue remains a critical concern due to its impact on safety and productivity. The project, with SCT Logistics as a partner organisation, sought to explore factors beyond sleep, such as workplace conditions and driver engagement, to develop more comprehensive strategies for mitigating fatigue.

Key Discoveries

- The project identified excessive wait times as a key contributor to driver fatigue, with drivers reporting significant frustration and disengagement during prolonged idle periods.
- The project revealed that driver engagement and workplace complexity are critical factors linked to fatigue.
- Wearable technology data reinforced the importance of sleep quality over quantity in maintaining alertness and highlighted that workplace factors significantly influence both sleep and alertness.

Finding A Solution

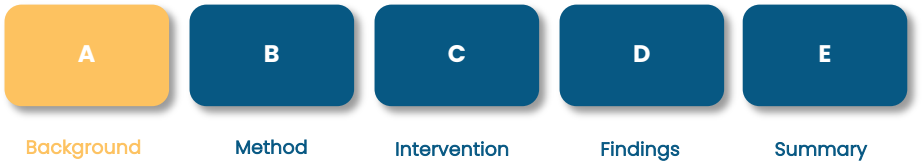
- A driver wait time tool, called 'WaitLoss', was developed to make wait times visible and manageable for leaders to action improvements.
- The tool, which has been adopted by SCT Logistics, represents a strategic approach to managing wait times and improving operational efficiency.
- Supervisors were also upskilled with strategies to manage wait times effectively, contributing to a more supportive and efficient work environment.
- The project also demonstrated a clear engagement and co-design process with SCT, highlighting the role of leadership and governance in addressing fatigue.

Benefits to Industry

- The project produced a prototype WaitLoss tool can now be shared with the broader industry as a practical solution for managing wait times.
- The engagement process with drivers and the co-design methodology used in developing the tool provide a valuable framework for future preventative interventions.
- Key insights can be shared into the link between workplace complexity, driver engagement, and fatigue offer data-driven strategies for enhancing driver alertness and overall safety.

Section A.

Background



Background

Context

Despite an emphasis on research and interventions to address fatigue, it remains an ongoing issue of concern in the heavy vehicle industry given its link to collisions and the individual and organisational outcomes of such incidents. While regulations and well-established fatigue management protocols exist, there appears to be a limit on their ability to further improve alertness and reduce associated accidents amongst drivers.

Project Wide Awake therefore sought to improve driver alertness by investigating factors beyond fatigue and levels of sleep, including workplace simplification and physical well-being, as well as asking drivers about things that decreased levels of alertness. The project was funded by Australia's National Heavy Vehicle Regulator (NHVR) through its Heavy Vehicle Safety Initiative (HVSI) grants program. This program is administered by NHVR on behalf of the Australian federal government, and *"...supports implementable, value-for-money projects that deliver tangible improvements to heavy vehicle safety*". The project was conducted in the Australian state of Victoria.

For the project, Opposite partnered with SCT logistics, a national transport and logistics company. Working closely with them, the project team were able to work closely with SCT, and through data, observation, and co-design, gained an in-depth understanding of relevant factors, and developed an intervention tool. The broader industry was also engaged via an online survey which captured data from outside of SCT to provide a wider range of perspectives.

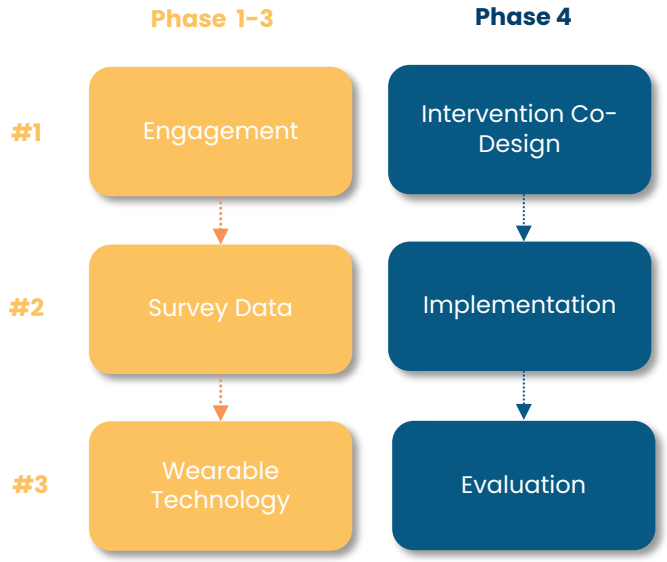
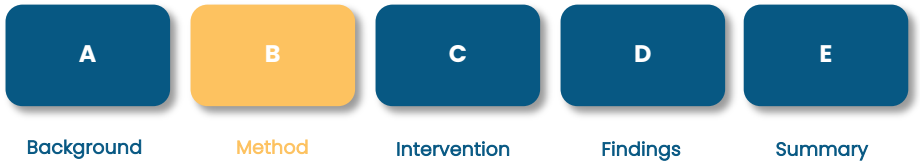


Figure 1. Phases of the Project

Section B.

Method



Method

Sample Sizes

- 106 Participants (Online Survey)
- 32 Drivers from SCT (Online Survey)
- 74 Drivers from Industry (Online Survey)
- 19 Fitbit Users from SCT
- 3 Managers for Tool Usability Testing

PARTICIPANTS

Online Survey

For the survey data collection phase, there were 106 participants overall, 37 of whom completed the basic survey, and 69 of whom completed the extended survey. There were 32 drivers from SCT – 30 who completed the survey online or in paper format, and 2 who answered the same survey questions as part of the ride-alongs, of which half (16) completed the basic survey, and half completed the extended survey. For the broader industry sample, there were 74 participants of whom 21 completed the basic survey and 53 completed the extended survey.

The majority of SCT drivers (31 or 97%) worked as within-state drivers, while (47 or 63.5%) of broader industry drivers worked as within-state drivers. Participant drivers came from every state in Australia; however, the majority were from the east coast with Victoria (23.5%), New South Whales (23.5%) and Queensland (19%) making up the majority. South Australia was the next most frequent (14%).

Wearable Technology

Wearable technology was defined as Fitbit device, and the sample was limited to drivers from our partner organisation, SCT, due to the need for consent and assistance in setting up the devices. Initially, Fitbit devices were provided to 27 drivers; however; due to some participants not wearing the device consistently the final sample of usable data came from 19 drivers. Of these, the majority were (13) were from Victoria (6 from Altona site, 7 from Horsham), 4 were from South Australia, and 2 were from Queensland.

Usability Testing

Participants for the co-design phase of the intervention included a range of stakeholders from SCT including managers and fleet supervisors. For the implementation and evaluation phase, three managers/fleet supervisors at SCT (each varying in the geographical locations their fleet covered) were recruited to the project.

Participant numbers and demographics varied depending on which part of the project was being completed.

Method

Surveys & Data

- Wide Awake Survey (Brief)
- Wide Awake Survey (Full)
- Fitbit Data
- Usability Survey
- Current State Survey

MEASURES

Online Survey

This survey included 9 items that assessed 9 relevant personal and workplace factors including: Alertness, Work Environment, Simplification, Relationships, Task Variety, Autonomy, Job Satisfaction, Health, and Sleep (Sleep Quality). Responses were made using a Likert-scale (1 = strongly disagree, 5 = strongly agree) where higher scores indicated more positive levels of each factor (e.g., greater alertness; higher job satisfaction). There were also 2 additional free text items; one asking drivers to list the main causes of fatigue at work (apart from sleep), and the other asking them to list 3 things they would simplify at work. This brief scale was used to maximise likelihood of completion whilst still gathering useful and relevant data.

The 26-item full survey included the same 9 items from the brief survey, with the addition of 3 items that measured the how simplified the workplace was in general; 8 items that evaluated an 8-factor model of simplification developed in a previous project (e.g., Workflow; Communication); 4 items that evaluated psychological capital as a proxy for wellbeing, including Optimism, Hope, Self-Efficacy and Resilience; and 2 items that measured workplace engagement including Absorption and Attention.

Wearable Technology

Fitbit was selected as the wearable technology for the project due to reasons involving suitability and safety. These devices are capable of tracking various physiological markers, such as sleep (hours of sleep, nocturnal awakenings, and nap data) and activity (step count and sedentary minutes). They are also considered safe for the driver community with respect to their ergonomic and slim design and were not expected to impact the driver's day to day tasks when worn.

Usability Testing

This 6-item measure was designed to relevant usability factors over 4 timepoints. Responses were made on a Likert-scale (where 1 = strongly disagree, 5 = strongly agree), and items evaluated common usability factors such as ease of use, perceived impact, and effectiveness. A 4-item current state measure was given to the three SCT managers/fleet supervisors participants prior to the tool roll out to understand how wait times were currently assessed; the frequency with which this occurred; how identified issues were currently addressed, and; the perceived effectiveness of current wait time assessment.

Method

Key Stages

- Wide Awake Online Survey
- Fitbits
- "Wait-Loss Tool"

PROCEDURE

Online Survey

The initial phase of the project involved the survey completion. This started with our partners (SCT) and was also broadened out to the online survey available to industry more widely.

Following intake of participant numbers from SCT, the project team focussed on engagement and was able to more than double the amount of SCT staff taking part.

Two analyses were then conducted on survey results; one to look specifically at SCT results to inform the intervention phase, and one to look at the overall data including that from SCT and broader industry.

Wearable Technology

Next, the physiological data phase was commenced. This involved collaborating closely with a specific group of SCT drivers who volunteered to participate. These drivers received Fitbit devices in two distribution waves (March 20th and April 26th, 2023). During the period from April 3rd to May 18th, participants also completed the WA survey. Fitbit data collection concluded on July 6th.

Usability Testing

The commencement of the intervention phase overlapped with the prior (i.e., Fitbit data gathering). Workshops and meetings with relevant stakeholders at SCT were held to introduce, modify and optimise the Wait-Loss Tool, and the current state and usability surveys were rolled out over 4 time periods, each with the same participants to track progress over time. As well as gathering usability data, later sessions also focussed on exploring strategies and interventions to address wait time trends identified at earlier time points.

Section C.

Intervention

Intervention

Rationale for Intervention Design

Based on Wide Awake survey analysis and discussions with drivers and supervisors, the issue of "wait times" for drivers was identified to have a significant link to driver fatigue.

Specifically, it is defined as the physical time that a driver spends at a customer location waiting, and this was identified as one of the biggest challenges for drivers in their day-to-day roles, and something they identified as a risk factor for fatigue.

By examining this further, the project has explored the fact that when a driver is waiting as a customer location, they are not in a state of complete rest, nor are they mentally stimulated enough to feel and remain naturally alerted.

Several workplace factors were identified and found to be contributing to lengthy wait times, and low levels of driver reporting. Many of these relate to customer systems and processes. Research suggests that lengthy wait times is likely to have an impact on business costs and operations, as well as the psychological wellbeing and fatigue of drivers. This is depicted in Figure 2.

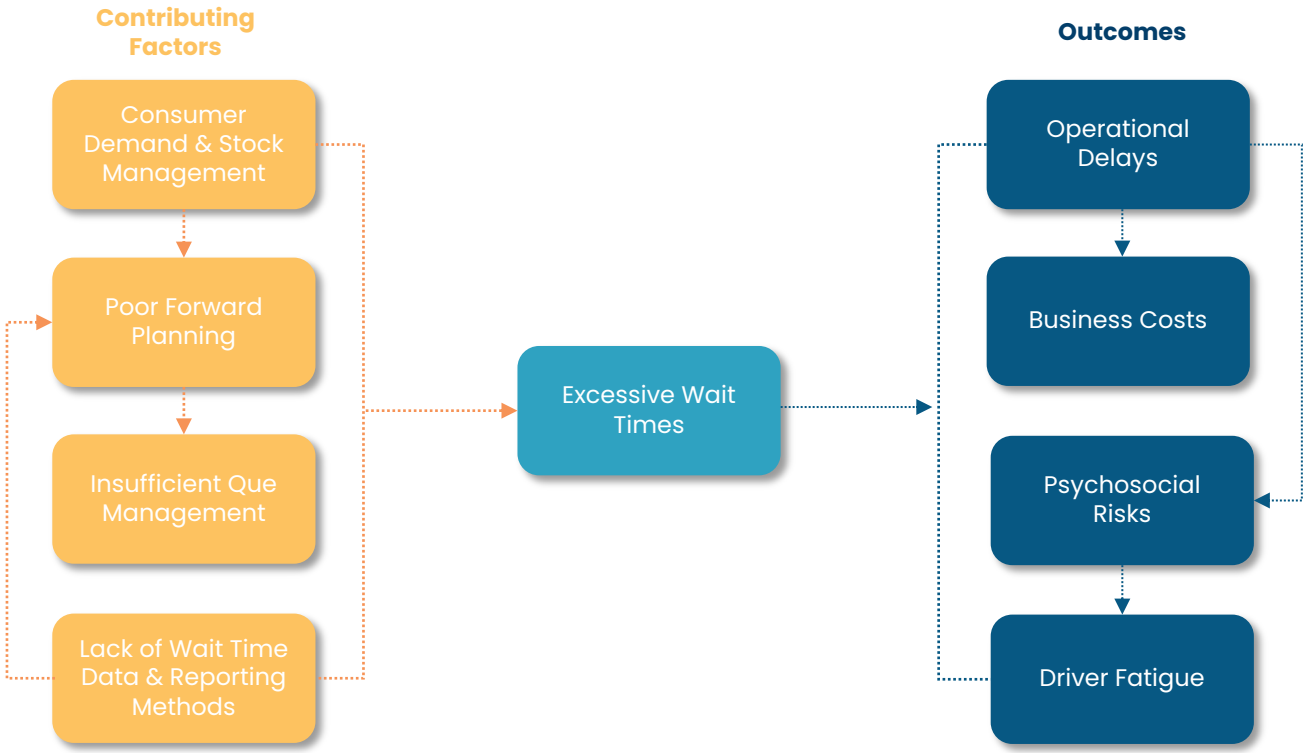


Figure 2. Impact of Excessive Wait Times

Intervention

Rationale for New Approach

Co-design sessions and observation with SCT logistics has revealed that the current process for monitoring wait times relied upon drivers reporting them to the fleet manager (used interchangeably with "fleet supervisor") who acts as the conduit between the driver and the customer. Drivers often did not report the issue, perhaps in part because customers typically didn't take any action to improve wait times.

At the time, there was no clear and accurate tracking of wait times, and no incentive for customers to make improvements. An industry wide challenge was identified – where drivers, who are the most at risk of the negative effects of excessive wait times, are given the least power and autonomy to change them. The process is implemented as a reaction to excessive wait times, rather than being a preventative approach.

The alternative and more proactive approach (Figure 3) was a cornerstone for the intervention phase, and for the Wide Awake project in general. It involves leveraging existing technology and systems (i.e. MT Data) to provide greater visibility and support the reporting of wait times. Increased communication with drivers is a key component. Page 12 (Figure 4) provides a pictorial and visual representation of how the intervention was developed to target short- and long-term benefits. The phases of this intervention are explored further in Page 14-26 of this report.

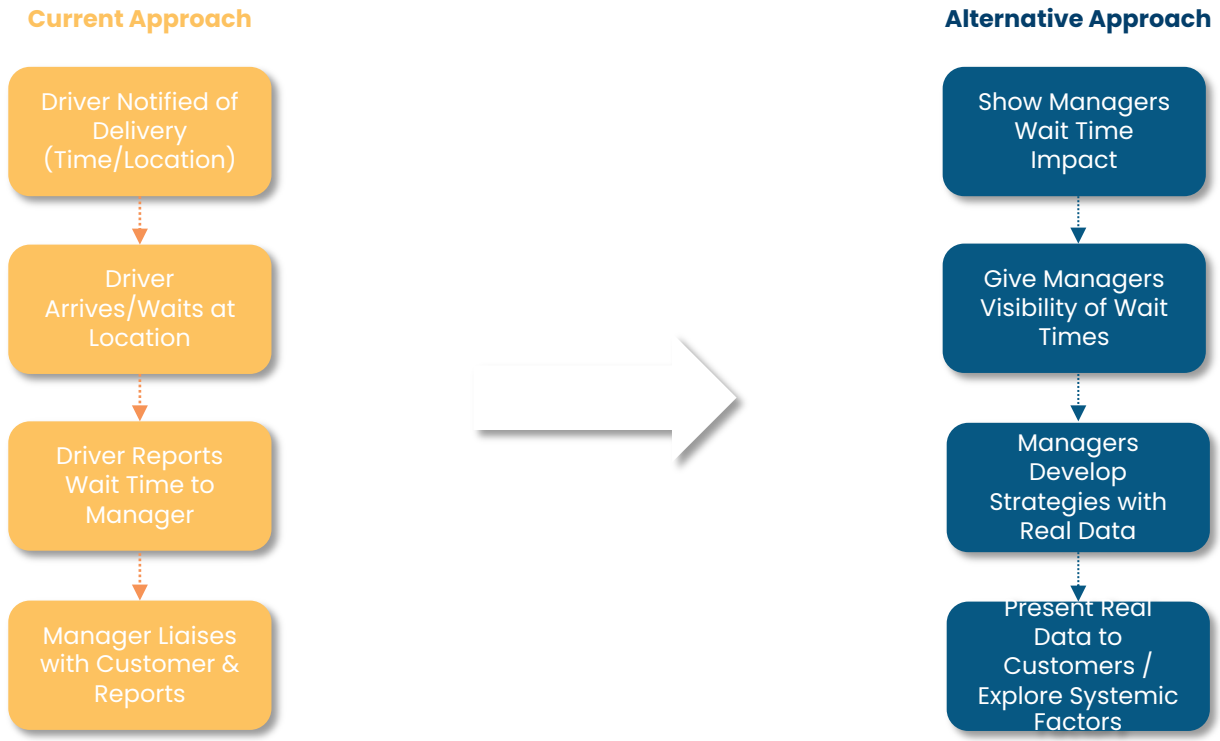


Figure 3. New Approach to Monitoring Wait Times

Intervention

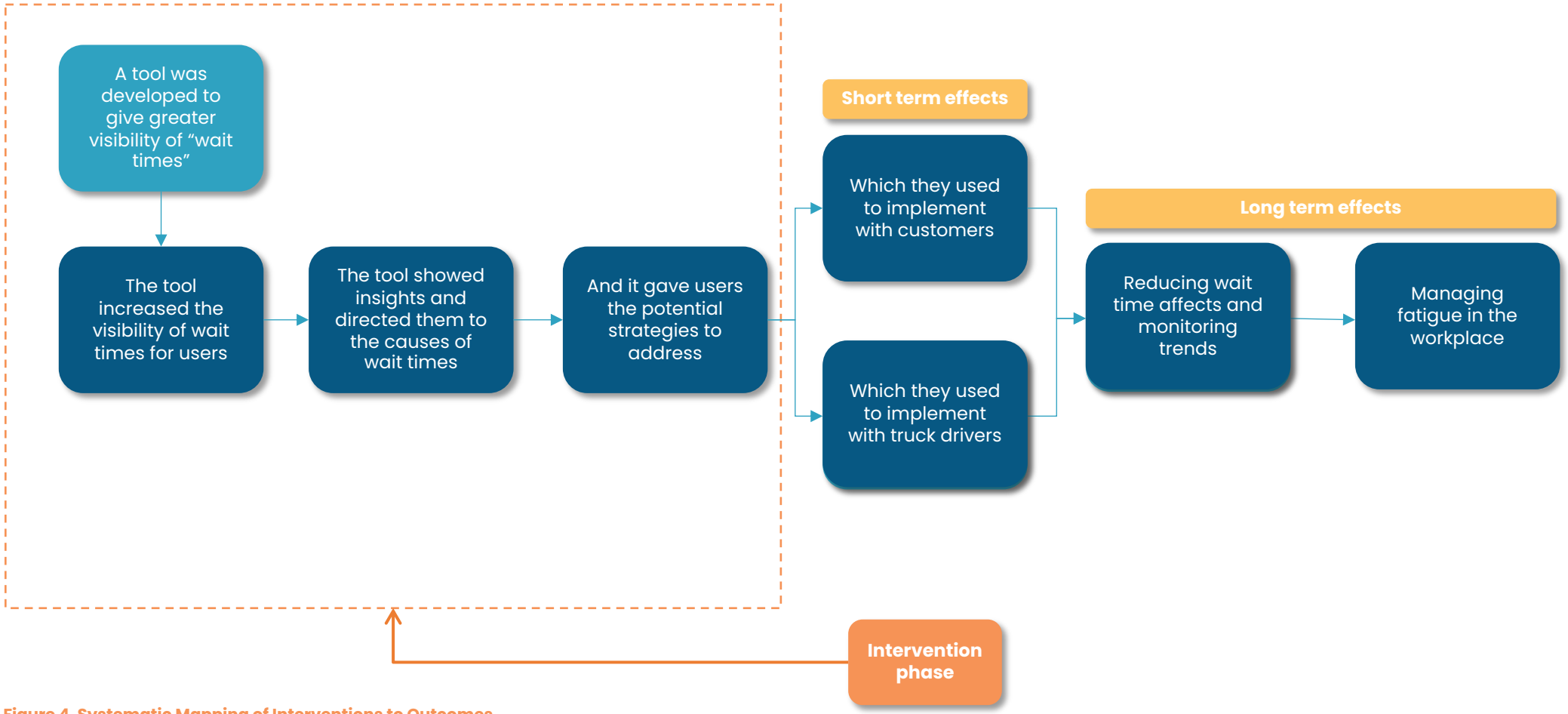
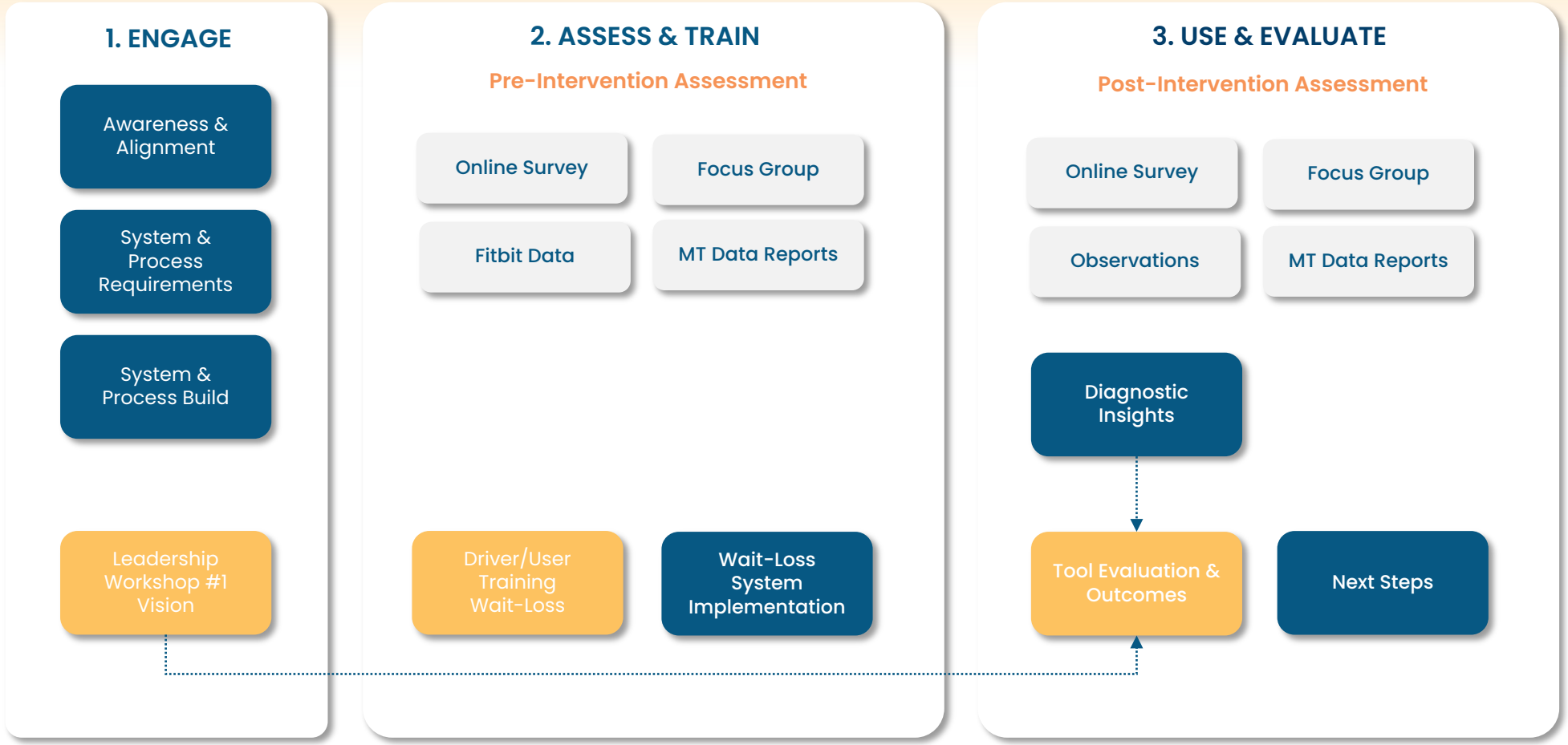


Figure 4. Systematic Mapping of Interventions to Outcomes

Intervention



Intervention

PHASE 1

- Awareness & Alignment
- System & Process Requirements
- System & Process Build
- Leadership Workshop #1 Vision

ENGAGE

Stakeholder and Leadership Engagement

In the first pre-intervention phase, stakeholder and leadership engagement was conducted by Opposite to establish a shared understanding of the Wait-Loss Intervention and its design elements. An overall vision was established, considering the scope, risks, and intended outcomes of the intervention. The workshop involved managers/fleet supervisors at SCT sites and was conducted online, lasting approximately 90 minutes.

The objectives of the workshop were to share findings from Wide Awake data collection and analysis, outline the rationale and benefits of the Wait-Loss Intervention, agree on a system/process for logging and reporting wait times, establish roles and responsibilities, including governance, and discuss key risks and mitigation strategies. This workshop proved to be critical for the design and development of the interventions.

Intervention Toolkit

A clear and straightforward system/process was developed for logging and reporting wait times, utilising existing technology and systems. Preliminary discussions indicated that MT Data had the capability to support an enhanced monitoring process for wait times. A user needs analysis was conducted to ensure that drivers were supported and enabled to log wait times efficiently.

Importantly, MT Data was recognised as a software that is currently integrated and accessible for the managers/fleet supervisors at SCT logistics. MT Data is a geo-fencing tool that tracks the exact whereabouts of the trucks in the fleet. As well as give visibility of physical locations and timestamps, it also has the capacity to record and categorise the times a truck is off moving, or when stationary (completely off, or in idle).

Intervention

PHASE 2

- Online Survey
- Fitbit Data
- Focus Group
- MT Data Reports
- Driver/User Training Wait-Loss
- Wait-Loss system Implementation

ASSSESS & TRAIN

Assessments

Pre- and post-intervention assessments were developed to facilitate the effective evaluation of the intervention's impact and success. Multiple assessment methods were incorporated to evaluate various outcomes and enhance validity, encompassing both objective and subjective data points.

These methods included current state surveys, assessing how wait times are currently perceived, and issues are addressed, usability tests (administered at various timepoints) as well as outcome tests. Further information on these surveys and tests is provided in later stages of the report. Key actions involved the development of the Wait-Loss tool and the associated assessment materials, and the facilitation of the sessions with two Psychologist Consultants from Opposite.
The assessments, which were built into usability testing sessions, had three main aims:

1. To increase visibility of wait times for managers.
2. To understand wait times in a way that was not previously possible.
3. To Use the tool to develop interventions to address wait time issues.

Training

Training was provided to managers/fleet supervisors at SCT during useability testing sessions. A total of four sessions at four different time points (referred to as T1 to T4) took place with three managers/fleet supervisors at SCT, each varying in the geographical locations their fleet covers. This is explored further on Page 20-21.

System Implementation

Following the training, drivers began implementing the new system and trialling the use of the new tool that was developed. During this period, leaders were responsible for:

- Providing support to drivers in adjusting to the new process
- Reminding drivers and monitoring compliance with the new system
- Recognising and rewarding drivers who used the system correctly.
- Communicating progress and updates to the team
- Notifying the Wide Awake project team of any issues encountered during the implementation phase

Intervention

PHASE 3

- Online Survey
- Observations
- Focus Group
- MT Data Reports
- Diagnostic Insights
- Wait-Loss system Evaluation

USE & EVALUATE

Analysis

Analysis post-intervention will involve repeating the pre-assessments and incorporating observations made by leaders. These observations can be further explored during the second leadership workshop. The analysis aims to provide insight into any changes in data resulting from the intervention.

This report forms part of the post intervention analysis, detailing the design and rationale for the intervention, as well as providing a succinct summary of the findings and outcomes. This report, along with the outcomes, will be shared internally at SCT and with the broader industry through the Wide Awake communications plan, which includes dissemination via the Wide Awake website.

Next Steps

During the final phases of the projects, leadership workshops will occur whereby participants will engage in reflections on the effectiveness of the trial and discuss next steps. The workshop will involve:

- Summarising the trial and assessment results
- Sharing observations and insights gathered throughout the trial
- Reflecting on aspects that worked well and areas for improvement
- Agreeing on how wait time data will be utilised to advocate for Wait-Loss with customers
- Seeking approval for further rollout across other sites

Additionally, the workshops will address the next steps for Wait-Loss beyond the trials of the tool, exploring potential future initiatives and strategies.

Intervention

Strategies

- Explore Driver Perceptions
- Explore Wait Time Causes
- Explore Long Term Trends
- Explore Seasonal Trends

THE WAIT-LOSS TOOL

The Co-Design Process

The Wide Awake project conducted multiple surveys and interviews with drivers and management, revealing that long wait times were disengaging and fatiguing for drivers. Management lacked an efficient way to capture driver wait times to address this issue. As a response, we co-designed the Wait-Loss tool, a dashboard that simplifies wait time data from existing on-board recording technology (MT data) into an accessible format. The tool aims to reduce driver fatigue and increase engagement by addressing one of the main causes of fatigue and disengagement: unnecessary wait times. The dashboard includes features such as a map of Australia with SCT regions marked, wait time data for each region and location, and customisable date selection options.

Page 18 provides screenshots of the tool. Figure 5 provides a snapshot of the “Dashboard” page. This allows users to import and control data coming into the tool. Reports from MT Data are imported directly into this page, and multiple locations and reports can be imported. On the back end (Figure 6), users can view synthesised data and filter wait times by location, date and duration, whilst also being able to sort data trends by longest, shortest and average wait times.

Trends & Usability

Furthermore, the project team outlined realistic and useful ways in which SCT can utilise the tool to improve driver engagement and reduce fatigue. Strategies include cross-checking driver experience against data, identifying locations with the longest wait times for targeted interventions, analysing patterns across sites, and using data to support negotiations with customers. Additionally, this proposed strategies to explore driver perceptions and wait time causes, involving both drivers and clients in the process. These strategies aim to challenge perceptions, identify root causes, and foster collaboration with clients to address wait time issues effectively.

Intervention

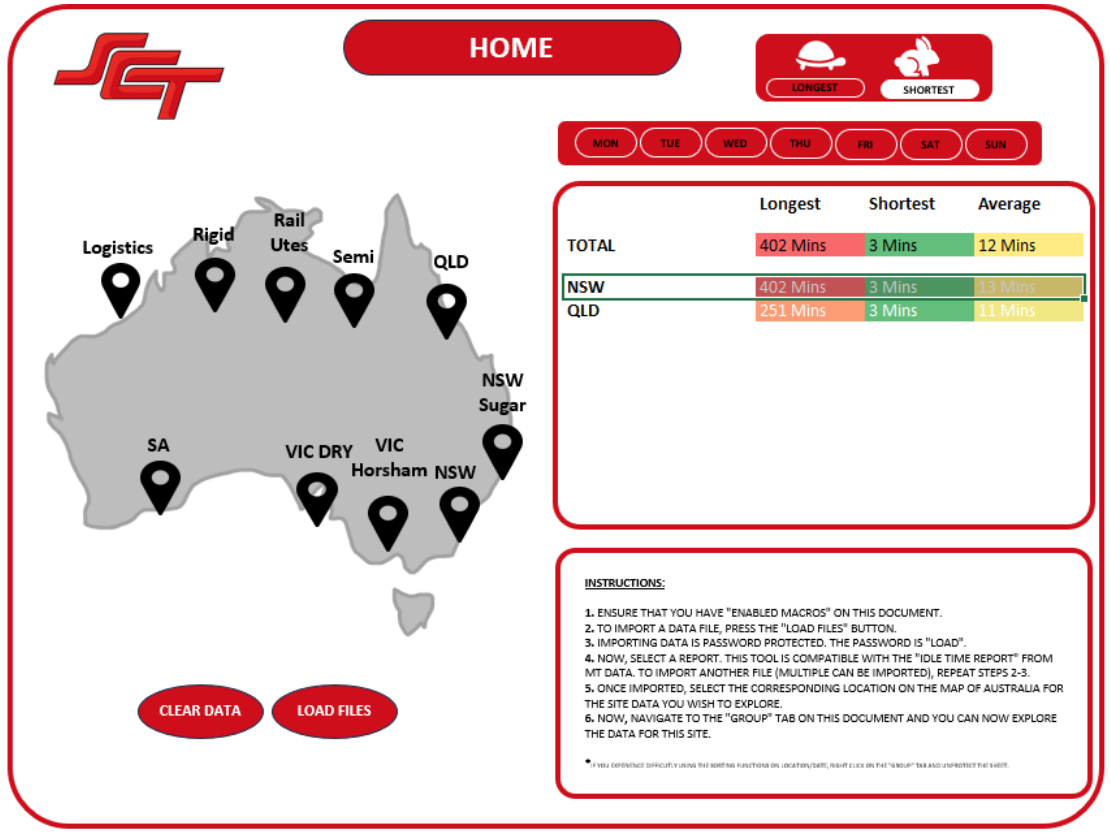


Figure 5. Screenshots of the "Wait-Loss" Tool (Dashboard)

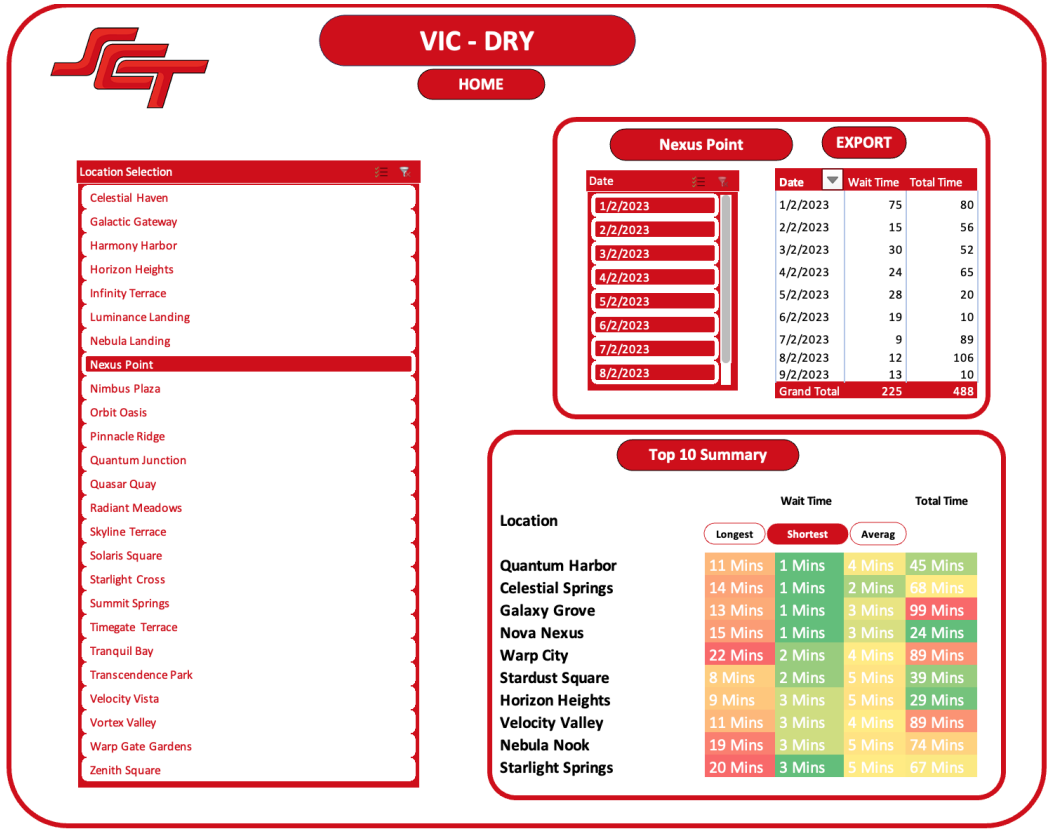


Figure 6. Screenshots of the "Wait-Loss" Tool

Intervention

Manager Strategies

One of the critical goals of the sessions ran with users of the Wait-Loss tool, in additional to testing its usability, was to develop strategies for how wait times can be addressed.

The tool was recognised as an integral component to increasing the visibility of wait times for the users, and provided direction and insight as to where potential causes of wait times issues may be.

Focus areas, as shown to the right of page were developed prior to the sessions, and introduced as means of addressing underlying contributing factors. The intention of these focus areas was to assist users in the development of strategies.

Strategy development was a key feature in each of the sessions and strategies were evaluated in the final two timepoints. See page 21 for more information on these timepoints.

Focus Area #1

Explore Driver Perceptions

- Present true wait times to drivers to challenge their perception of the wait time and/or address causes for these wait times.
- Explore methods with schedulers to increase novelty or rotate destinations for routes perceived to be long or perceived to be associated with boredom/fatigue.

Focus Area #2

Explore Wait Time Causes

- Engage with drivers to explore why wait times are/were particularly high to identify likely causes.
- Meet with client representatives to discuss any client-specific issues and work through strategies to address wait time data.

Focus Area #3

Explore Long Term Trends

- Collaborate with HSE to develop a monthly report to identify specific geographical/site trends.
- Meet with client representatives to discuss trends and identify strategies and impact wait time trends through positive change.

Focus Area #4

Explore Seasonal Trends

- Develop a report with HSE to identify wait time patterns per season.
- Anticipate seasonal trends by modifying shifts to accommodate longer wait times (e.g., longer breaks, shorter shifts). Data is used to anticipate/predict trends, and shifts are modified to reduce seasonal trend impacts.

Intervention

Outcomes

- Administer Current State Survey
- Examine Usability Data (T1 – T4)
- Tool Tutorial & Practice
- Strategy Development

USER TESTING

Why This Tool

The Wide Awake project identified a significant link between driver fatigue and the time spent waiting at customer pick-up sites. To address this issue, the Wait-Loss tool provides real time data on truck idle times at various locations. Through a series of user tests conducted at four different timepoints (T1-T4), feedback was gathered to devise strategies for tackling wait time issues effectively.

Page 21 provides a summary of data collected across each of the four timepoints (T1-T4).

Operationalising “Wait Times”

This was the key intervention—along with specific leader strategies—identified by the organisation to address the systemic cause of wait times on fatigue. This tool analyses and increases visibility of driver wait times for fleet and account managers. The concept of wait times, or in other words, the time a driver spends in the truck in "idle" at a customer location, was found to be linked to fatigue management, as indicated by our research with truck drivers. In conceptualising fatigue this way, contributing factors are addressed. Managers ratings and views to the likely impact on long-term fatigue of drivers was evaluated throughout this phase of the project. Over the last phase of the project, the Wide Awake project team has facilitated these sessions with users from SCT, assessing its usability, providing tuition and seeking feedback for potential refinements.

Intervention

T1

Introduction & Current State

- Users were introduced to the Wide Awake tool, assessed their current state and the tools initial usability, and brainstormed opportunities for improvement.

T2

Tool Practice & Exploring Trends

- After approximately two weeks of using the tool, users re-evaluated its usability, practiced importing data, and began exploring wait time trends at different locations.

T3

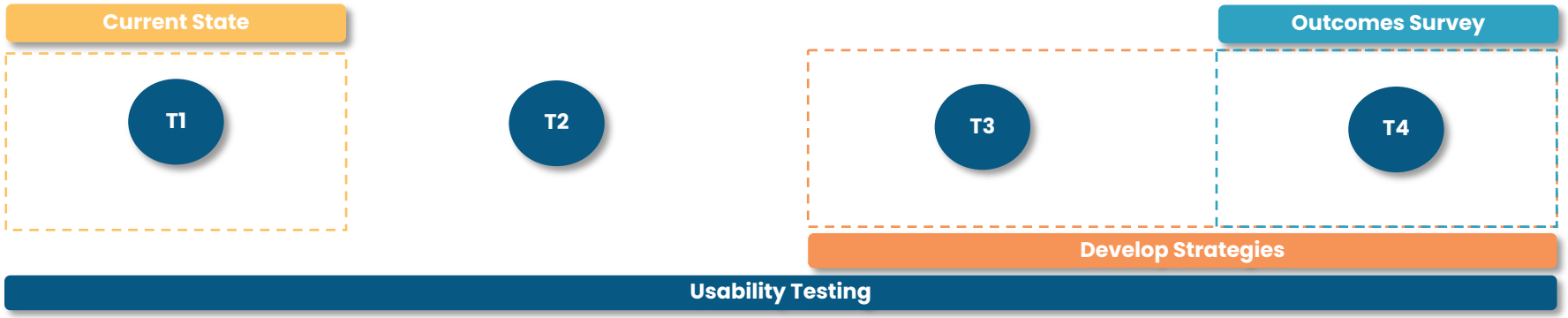
Tool Practice & Developing Strategies

- Four to six weeks into the project, users revisited usability assessments while also focusing on exploring strategies and interventions to address wait time trends identified since T2.

T4

Evaluate Strategies & Outcomes Survey

- Users will complete a final post-intervention usability survey, assess the implementation of established goals, and evaluate the overall outcomes and effectiveness of the Wide Awake tool.



Intervention

Session Goals

- Assessment Methods
- Frequency of Wait Time Assessments
- Management of Wait Time Issues
- Perceived Effectiveness and Complexity

USER TESTING (CONT.)

Current State Survey

In the initial current state survey conducted before the implementation of the Wide Awake tool (i.e. administered with users during T1, at the beginning of the session), several key findings emerged. Prior to tool implementation, driver wait times were predominantly assessed using MT data or through other unreliable software. This was done directly, by sifting through the software, or through conversations with managers. The frequency of wait time assessment varied among users, ranging from "at least once a day" to "random/as needed." Wait time issues were primarily managed through the exploration of data and the maintenance of relationships with customers. Users rated the approach to assessing and managing wait times as neither effective nor ineffective. However, they reported it to be complex and tedious.

Usability Testing

Six usability test items were developed as part of this survey (shown on page 23). These were administered on a 1-5 agreeableness scale (strongly disagree; disagree; neutral; agree; strongly agree). Results are presented on page 37 and after four sessions, the average score ranged from 3.83 to 4.67. At each time point, the average of all test items was positive and favourable, with at least 4 out of 5 scored (meaning that users either agreed or strongly agreed on average to test items relating to the usability of the tool).

Outcomes Testing

Three outcomes were assessed at completion of the four sessions. These outcomes are shown on page 24, and similarly to usability testing, were administered on a 1-5 agreeableness scale. Results are shown on page 38, and were for the most part favourable, with one user remaining neutral (scoring 3) on 2 out of 3 of the test items. Results are explored in the “Findings” section of this report.

Intervention

Test Items

Ease of Use	The tool was easy to use.
Information Retrieval	The tool helped me to find the information that I needed.
Addressing Wait Time Issues	The tool helped to address wait time issues.
Work Simplification	The tool helped simplify my work.
Visibility Enhancement	I believe continued use of the tool will enhance the visibility and management of wait times.
Driver Fatigue	I believe continued use of the tool will have a positive effect on reducing driver fatigue.

Test items were administered on a 1-5 agreeableness scale.

Intervention

Test Items

Wait Times Visibility	The tool has increased my visibility of wait times in my workplace.
Wait Times Understanding	The tool has helped me understand wait times in a way that was not previously possible.
Strategy Development	The tool has helped me with implementing strategies in the workplace to address wait time issues.

Test items were administered on a 1-5 agreeableness scale.

Intervention

Continuous Improvement

Following the intervention phase, the project transitioned into a phase focused on continuous improvement and monitoring the use of the Wait-Loss tool. This involved regularly assessing the effectiveness of the tool in addressing wait time issues and mitigating driver fatigue.

Continuous feedback loops were established to gather insights from drivers and managers, enabling adjustments and refinements to be made as needed (Figure 7). Importantly, this phase of the project remains on going, as Opposite and the Wide Awake project team continue to work with SCT, the partner organisation, refining this tool and it's roll out to the entire organisation.

For example, a template for reporting has been proposed to assist managers in tracking key metrics related to wait times, driver engagement, and operational efficiency. This template will provide a structured framework for managers to analyse trends, identify areas for improvement, and refine their strategies over time, ensuring sustained progress towards enhancing safety and productivity within the transport industry.

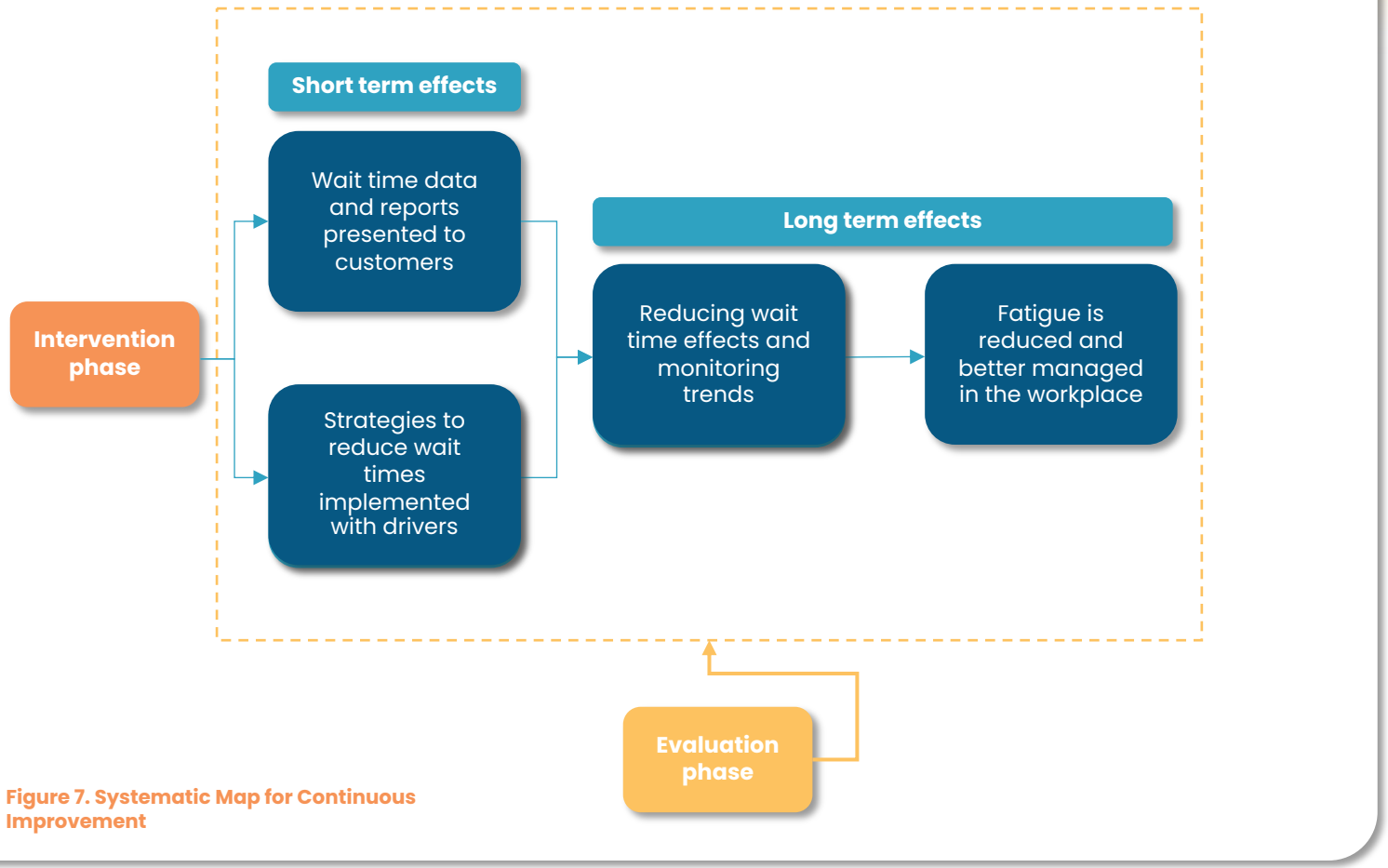
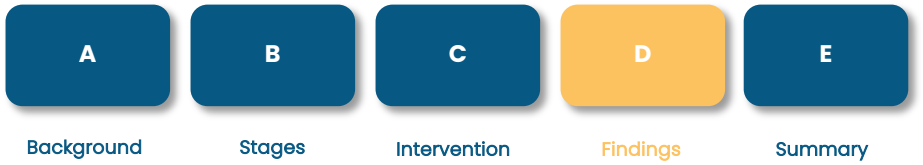


Figure 7. Systematic Map for Continuous Improvement

Section D.

Findings



Findings

Key Findings

- Poor Quality of Sleep for 32% of Drivers
- 1/5 Experience High Workplace Complexity
- 26% Experience Low Wellbeing/Engagement
- Wait Times, Boredom and Delays = Fatigue

ONLINE SURVEY (BRIEF)

Key Survey Findings

Findings from the project's industry and organisation wide survey data are summarised below, and mean scores are found on Page 31.

- The SCT sample appeared to be generally reflective of the industry more broadly
- Drivers at SCT tended to rate task variety slightly higher than the industry of within-state drivers*
- Interstate drivers rated their alertness higher than the within-state drivers*
- Despite interstate drivers rating themselves as more alert, they were less satisfied in their jobs than within state drivers*
- There was no significant differences in our sample between within versus interstate drivers when it came to sleep, health, or fatigue
- Overall, the minimal differences found between the within and interstate drivers across the 9 items suggest that interventions that are effective for within state drivers may also benefit interstate drivers.

SCT vs Industry

There were no significant differences between the 2 groups for within-state drivers when it came to work environment, simplification, relationships, autonomy, job satisfaction, health, and sleep.

Task Variety

The higher ratings for SCT drivers on task variety could be attributed to how SCT tend to rotate drivers across trucks and locations.

Alertness

The higher ratings for SCT drivers on alertness could be attributed to the increased variety they experience, or cognitive bias around fatigue

The higher ratings for interstate drivers could be due to a reluctance to admit fatigue, or a development of skills and strategies for remaining alert while driving due to the industry-wide focus on fatigue management.

**Result is statistically significant*

Findings

Key Findings

- Poor Quality of Sleep for 32% of Drivers
- 1/5 Experience High Workplace Complexity
- 26% Experience Low Wellbeing/Engagement
- Wait Times, Boredom and Delays = Fatigue

ONLINE SURVEY (BRIEF)

Correlation of Variables

- A correlation analysis on variables subjectively rated by drivers was run to explore relationships between factors. This included Alertness, Control, Health, Job Satisfaction, Satisfying Relationships, Simplification, Sleep Quality, Task Variety and Work Environment.
- Of note, **Alertness positively and significantly correlated with Health, Workplace Simplicity, Sleep Quality and Work Environment*.**

Regression of Variables

- Each of the factors found to significantly correlate with Alertness (Health, Simplification, Sleep Quality and Work Environment) was entered into a regression equation to further explore their relationship with alertness.
- Perhaps unsurprisingly, **past month sleep quality was the strongest predictor, accounting for 26% of the variance in alertness scores; general health accounted for 11%, while work environment was only 6%. Overall, these 3 factors accounted for almost half (43%) of the variance in alertness scores.**

Moderation & Mediation of Variables

- It was then explored whether the association between each of the factors was potentially due in part to the impact of another variable from the survey. The results of this showed that the relationships between alertness and both work environment and health were mediated by sleep. These findings are explored further on Page 29.

*Health $r(101) = 0.301$, $p < .001$, Workplace Simplicity $r(101) = 0.267$, $p < .001$, Sleep Quality $r(101) = 0.426$, $p < .001$ and Work Environment $r(101) = 0.249$, $p < .05$.

Findings

Key Findings

- Poor Quality of Sleep for 32% of Drivers
- 1/5 Experience High Workplace Complexity
- 26% Experience Low Wellbeing/Engagement
- Wait Times, Boredom and Delays = Fatigue

ONLINE SURVEY (BRIEF)

Work Environment & Alertness (Moderated by Engagement)

- At low levels of engagement, the negative relationship between the work environment and alertness is stronger. However, as engagement levels increase, this negative relationship weakens, indicating a buffering effect of engagement against the impact of the work environment on alertness.
- In other words, **higher engagement reduces the negative impact of a poor work environment on alertness.** This demonstrates that engagement plays a crucial role in moderating the relationship between the work environment and alertness.
- Enhancing employee engagement can be an effective strategy to improve alertness, even in less favorable work environments. Having a work environment conducive to doing one's best work led to increased levels of alertness but only among drivers who were more highly engaged at work.
- A work environment that does not enable drivers to do their best work causes greater levels of fatigue for drivers, especially those with lower levels of engagement. This suggests that the opposite might also be true – a work environment that enables drivers to do their best work increases alertness, especially those that are more engaged with their work.

Health & Alertness (Moderated by Engagement)

- Increased health leads to greater alertness. The reverse is also true, where poor health has negative impact on alertness. A further finding revealed that at low levels of engagement, the positive relationship between health and alertness is stronger. Specifically, higher engagement can act as a buffer for the effects that poor health has on alertness levels.
- **Enhancing employee engagement can be an effective strategy to maintain high levels of alertness, even when health conditions vary.**
- Therefore, the strength of the relationships between alertness and the work environment and general health may vary depending on how engaged drivers are when at work.
- Keeping drivers engaged can therefore assist in protecting against reduced alertness cause by a workplace that is not optimal for doing one's best work and for buffering against the effects of poorer health on alertness levels.

Findings

Key Findings

- Poor Quality of Sleep for 32% of Drivers
- 1/5 Experience High Workplace Complexity
- 26% Experience Low Wellbeing/Engagement
- Wait Times, Boredom and Delays = Fatigue

ONLINE SURVEY (BRIEF)

Interpretation of Results

- A work environment that enables drivers to do their best work assists drivers to sleep better and therefore to be more alert at work. For example, if the workplace is frustrating due to not providing the opportunity to perform well, this could lead to impacts on sleep due to stress or rumination, which could reduce alertness levels. Having better general health is likely linked to better quality sleep, and so healthier drivers are likely to be more alert than unhealthy ones due to having better quality sleep.
- **Reducing complexity is associated with higher job satisfaction resulting in improved sleep.** It may be that drivers who are dissatisfied with their workplace are more likely to have poorer sleep due to stress or frustration, leading to lower levels of alertness.
- **Better workplace relationships improve driver job satisfaction**, suggesting that drivers who enjoy being around the people they work with are more likely to be satisfied with their job, which in turn can improve sleep quality due to reduced levels of anxiety, stress or other internal states that could impact on sleep and therefore alertness.
- Overall, these findings suggest that although sleep has a direct and essential influence when it comes to alertness, other workplace factors can also have an impact. Specifically, creating a workplace that allows drivers to do their best work (such as not being held up by unnecessary wait times) and supporting drivers to maintain good general health influences alertness due to the impacts of these on sleep.
- Removing complexity and creating a culture that encourages building and maintaining good relationships with work colleagues can lead to better rest due to their impact on sleep quality and engagement.
- To further explore relationships between survey variables, exploratory moderation analyses were conducted. These analyses examine whether the relationship between two variables changes depending on the level of another variable. The following analyses included the full survey items also, to see if any of these other factors might be related to alertness.

Findings

	SCT Sample	Industry Sample	Combined Sample
Alertness	4.24	4.08	4.13
Work Environment	3.72	3.89	3.84
Simplification	3.88	3.57	3.66
Relationships	3.81	3.73	3.75
Task Variety	3.88	3.58	3.67
Autonomy	3.81	3.76	3.77
Job Satisfaction	3.81	3.73	3.75
Health	3.78	3.62	3.67
Sleep	3.68	3.43	3.50

Figure 8. Mean Scores for SCT and Industry for Wide Awake (Brief) Survey. Test items were administered on a 5-point Likert scale.

Findings

Key Findings

- Poor Quality of Sleep for 32% of Drivers
- 1/5 Experience High Workplace Complexity
- 26% Experience Low Wellbeing/Engagement
- Wait Times, Boredom and Delays = Fatigue

ONLINE SURVEY (FULL)

Analysis from the full (or 'extended') version of the project's industry and organisation wide survey data revealed that:

- The SCT sample appeared to be generally reflective of the industry more broadly in terms of workplace complexity overall
- There were no significant differences found between the SCT and industry within-state drivers, or between interstate and within-state drivers in relation to the measures of engagement and wellbeing

Page 33 and 34 further explore the means scores for each factor assesses in this survey. Page 34 includes the results for the sub-factors that fall under the factors for "Psychological Capital" and "Employee Engagement".

SCT Compared to Industry Drivers

- The industry overall reported experiencing significantly greater uncertainty in their role than SCT drivers
- When it came to complexity in terms of organisational structures, SCT drivers rated this as significantly more complex, than the industry drivers
- Job design was rated higher by SCT drivers than industry drivers

Within-state Compared to Interstate drivers

- Interstate drivers rated their work environment as significantly more complex than within state drivers
- Communication was significantly more complex for interstate drivers than within state drivers
- Information was rated as significantly more complex for interstate than within state drivers
- The work environment was more complex for interstate drivers than within state drivers
- Uncertainty appears to be more prevalent for interstate drivers than within state drivers
- Interstate drivers also rated structure as more complex (i.e., low scores on simplification of this subfactor) compared to within state drivers

Findings

	SCT Sample	Industry Sample	Combined Sample
Overall Simplification	3.90	3.51	3.60
General Simplification	4.15	3.76	3.85
Workflow	3.80	3.70	3.72
Communication	3.60	3.57	3.57
Information	4.37	3.54	3.72
Work Environment	3.72	3.31	3.41
Uncertainty	4.22	3.04	3.31
Structure	3.41	3.58	3.54
Products and Services	3.81	3.58	3.54
Job Design	4.06	3.45	3.59

Figure 9. Mean Scores for SCT and Industry for Wide Awake (Full) Survey. Test items were administered on a 5-point Likert scale.

Findings

	SCT Sample	Industry Sample	Combined Sample
Psychological Capital	4.17	3.85	3.93
Optimism	4.13	3.62	3.74
Hope	4.06	3.49	3.62
Self-Efficacy	4.31	4.09	4.14
Resilience	4.19	4.21	4.20
Engagement	4.03	3.75	3.81
Attention	4.00	3.68	3.75
Absorbed	4.06	3.81	3.87

Figure 10. Mean Scores or Psychological Capital and Employee Engagement for SCT and Industry for Wide Awake (Full) Survey. Test items were administered on a 5-point Likert scale.

Findings

Key Findings

- Sleep Data and Alertness Relate
- No. of Awakenings Relates to Suggested Sleep
- Greater Alertness, Means More Steps
- Sleep Quality and Alertness are Correlated

WEARABLE TECHNOLOGY

Statistical Analysis of Data

- Drivers who took more steps were generally more alert—accounting for 36% variance in alertness. This result approached statistical significance.
- For the 15 with data available, average sleep was 6.37 hours, of which an average of 21% was REM sleep, and 16% was deep sleep.
- Fitbit data and survey responses were matched for a small subset of these participants to examine relationships between the brief WA survey data and the physiological data. These analyses found across the entire dataset, the number of awakenings during sleep was significantly correlated with alertness.
- Time spent in bed was not found to be significantly correlated with alertness.
- When examining data within one day of survey results, the number of awakenings during sleep remained significantly correlated with alertness
- Time spent in bed was not related to alertness.
- Although self-reported alertness (from the survey item) was positively correlated with the number of steps taken, this was not significant.
- We also found no relationship between self-reported alertness and minutes spent asleep, and alertness and minutes in sedentary activity.
- Meeting the recommended level of sleep also increased job satisfaction.
- When considering average sleep durations between 7-9 hours per day, individuals who met the recommended amount of sleep rated themselves as significantly more alert and this trend persisted when analysing the data using different statistical parameters.
- **Similarly, meeting the recommended sleep duration was significantly and positively correlated with alertness, explaining 4.63% of the variance in alertness levels.**
- Meeting the recommended sleep significantly predicted alertness. However it was in the opposite direction! Individuals who met the recommended sleep rated their alertness lower (by an average of 0.2 points overall). It is possible that individuals who are less alert at work seek more sleep. Alternatively, individuals who sleep more may simply value it more than others, making them especially sensitive to their level of alertness during the day. That is, they set a higher bar for their levels of alert.

Findings

Focus Areas

- Explore Driver Perceptions
- Explore Wait Time Causes
- Explore Long Term Trends
- Explore Seasonal Trends

USABILITY TESTING

Scores for 'Wait Loss Tool' Usability

During the usability testing sessions, participants scored (on a 5-point Likert scale) the usability of the tool based on various factors (showed on Page 23). Mean scores for this are presented on Page 37. Findings show that the results were favourable across areas with the mean score ranging from 3.83 to 4.67 and were consistent across timepoints (above a 4). Outcomes for the tool (i.e., how well the tool achieved three outcomes at completion of the session) is presented on Page 24, with results shown on Page 38. Results were greater than 3/5 or above for all users.

Evaluating Focus Areas

During user testing of the Wide Awake tool, users were not only introduced to its functionalities but were also prompted to identify goals aimed at addressing wait time trends observed through tool usage. This feedback underscores the tool's multifaceted utility in enhancing operational efficiency and driver well-being within the transport industry. The top five trends identified are explored further on Page 39.

Evaluating Strategies Developed

The project focused on utilising Wait-Loss data to drive efficiency and improvement within the transport industry. Through trend analysis, including managing driver rosters to reduce exposure to prolonged idle times, areas for enhancement were identified. Internally, Wait-Loss data was integrated into regular reviews to evaluate wait time issues and interventions. Externally, the data assisted in objective discussions with customers, pinpointing causes accurately to support negotiations. Fleet manager and customer liaison meetings incorporated Wait-Loss data to implement targeted interventions. Past intervention results, such as roster management, were used to demonstrate benefits, particularly in reducing fatigue.

By feeding Wait-Loss data to higher executive levels, strategic decision-making was informed, influencing organisational change. Internal depot processes were refined through Wait-Loss data integration, while outputs could be shared with drivers to address concerns and validate perceptions. Areas of concern identified by Wait-Loss data were thoroughly investigated to drive continuous improvements, both internally and externally based on customer feedback.

Findings

	T1	T2	T3	T4	Average
Ease of Use	4.00	4.33	4.33	4.33	4.25
Information Retrieval	4.33	3.33	4.00	4.00	3.92
Addressing Wait Time Issues	4.33	3.67	3.67	4.00	3.92
Work Simplification	4.33	4.00	3.67	3.33	3.83
Visibility Enhancement	4.67	4.67	5.00	4.33	4.67
Driver Fatigue	4.67	4.00	4.00	4.33	4.25
Average	4.39	4.00	4.11	4.06	

Figure 11. Mean Scores for Usability Testing. Test items were administered on a 5-point Likert scale.

Findings

	User #1	User #2	User #3
Wait Times Visibility	4.00	5.00	4.00
Wait Times Understanding	3.00	5.00	4.00
Strategy Development	3.00	4.00	4.00

Figure 12. Mean Scores for Outcomes for Usability Testing. Test items were administered on a 5-point Likert scale.

Findings

The following trends were identified in the usability testing sessions with the users of the intervention tool. Data from interviews and user-testing sessions was elicited in semi-structured format and information provided was analyses thematically to establish the top five trends, defined as "the most common uses" of the Wait-Loss intervention tool. The trends provided were translated into action planning steps, arranged with the users to execute (provided on Page 40).

1

Data Driven Efficiency

- Utilising data for trend analysis to enhance efficiency and minimise exposure to prolonged idle times.

2

Transparent Cause Identification

- Integrating Wait-Loss data into both internal and external discussions to pinpoint causes accurately and support negotiation efforts.

3

Demonstrated Benefits of Past Interventions

- Leveraging past interventions, such as roster management, to showcase benefits and address fatigue effectively.

4

Strategic Decision Making

- Elevating Wait-Loss data to higher executive levels to inform strategic decision-making and drive organisational change.

5

Stakeholder Empowerment

- Empowering drivers and internal stakeholders with Wait-Loss outputs to validate concerns and drive continuous improvement efforts.

Findings

Action Planning

Based on trends identified in the usability testing sessions with the users of the intervention tool, key action. Through a co-design approach and regular check-ins, the Wide Awake project team facilitated an action-planning process where users, following the identification of the three themes shown on screen, could action next steps and ways to roll out and use the tool in practice.

1

Trend Analysis & Roster Management

- Despite current data slowdowns due to railway issues, the focus on peak vs. non-peak wait times and driver impact remains crucial. This action involved refining analyses during peak and non-peak periods to develop targeted strategies. Additionally, assessing how drivers were affected by wait times was essential for optimising roster management.

2

Internal Review Integration

- Quarterly reviews was identified as the preferred method for trend identification. This involved enhancing the efficiency of these reviews by fine-tuning data analysis methods and ensuring timely incorporation of findings into operational adjustments.

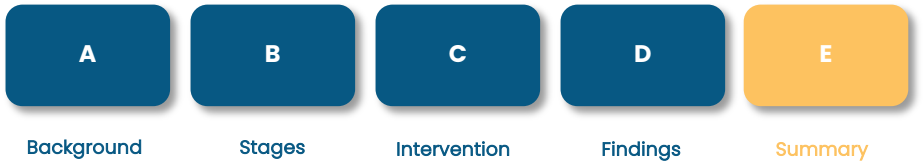
3

External Customer Engagement

- The data-driven approach has proven effective in reinforcing arguments and validating customer concerns, particularly with national and global clients. This involved leveraging this success to proactively address customer needs, using data insights to drive targeted interventions and improve overall customer satisfaction.

Section E.

Summary



Summary

Key Stages

- Wide Awake Online Survey
- Fitbits
- "Wait-Loss Tool"

DISCUSSION

Online Survey

Overall, drivers reported poor sleep quality, high complexity and low engagement, all of which may contribute to reduced levels of alertness at work. Wait times, boredom and delays can reduce engagement, and reduce alertness.

In addition, sleep quality, general health and having a workplace that allows drivers to do their best work were found to be related to alertness. Creating a workplace that allows drivers to do their best work, supporting drivers to maintain good general health, having a simplified workplace and creating a culture that encourages building and maintaining good relationships with work colleagues can all help to improve alertness levels due to their impact on sleep.

Other factors found than can impact on levels of alertness include sleep quality and general health, and sleep can be impacted by workplace relationships and job satisfaction suggesting alertness is not just influenced by sleep, but also workplace factors and that workplace factors themselves can impact sleep.

Engagement was also found to act as a moderator, whereby driver engagement levels were found to protect against reduced alertness caused by a workplace that is not optimal for doing one's best work and for buffering against the effects of poorer health on alertness levels.

Wearable Technology

Drivers averaged 6.37 hours of sleep per night, and drivers who had more nighttime awakenings also reported lower levels of alertness.

There was no relationship between self-reported alertness and minutes spent asleep, minutes spent in sedentary activity or time spent in bed which may indicate some limitations in the data and/or that sleep quality (rather than amount) is more important for alertness; however, we also found that sleep duration did not predict alertness, and so it may be that interrupted sleep impacts more on alertness than duration.

Summary

Key Stages

Wide Awake Online Survey

Fitbits

"Wait-Loss Tool"

DISCUSSION

Usability 'Wait Loss Tool' Testing

Working closely and collaboratively with our partner organisation, the Wait-Loss tool was co-designed as an intervention to address identified contributors to low alertness.

By making wait times more visible, the tool aimed to address the three key areas of wait time visibility, wait time management and strategy development, thereby increasing driver engagement and job satisfaction and increasing alertness.

Usability feedback showed that participants rated the ability of the tool to achieve these aims as very positive generally, and although there was not a large among of change across time points this likely reflected the high ratings that were presented immediately from the outset with limited scope for improvement.

Data-based processes and strategies have been adopted by SCT, meaning that wait time information derived from the tool has been incorporated into business practices across the organisation.

More than just a productivity intervention, the insights gained from the use of the tool have been rated as important for managing driver alertness, with an average rating by the user testing group of 4.25 (out of a maximum of 5) in relation to the tool being a way to manage driver fatigue.

Overall, the project found that alertness can be influenced by factors outside of the amount of sleep, and that drivers identified idle wait times a particularly frustrating and dis-engaging part of their work. A co-designed tool based on driver feedback was developed, implemented and evaluated, with positive outcomes reported. This approach has implications for industry more broadly, where a focus on alertness and engagement and the reduction of boredom, disengagement and unnecessary wait times via the use of tools like the WaitLoss intervention have the potential to make a positive impact on driver alertness

Key Findings & Industry Benefits

Achievements

- Identified engagement & complexity as cause of fatigue
- Identified & validated wait time as a key cause of fatigue
- Developed and tested an intervention tool
- Identified & tested leadership strategies for addressing wait time
- Established a tool & engagement process to handover to industry

THE WIDE AWAKE PROJECT

Key Discoveries

- The project identified excessive wait times as a key contributor to driver fatigue, with drivers reporting significant frustration and disengagement during prolonged idle periods.
- The project revealed that driver engagement and workplace complexity are critical factors linked to fatigue.
- Wearable technology data reinforced the importance of sleep quality over quantity in maintaining alertness and highlighted that workplace factors significantly influence both sleep and alertness.

Finding A Solution

- A driver wait time tool, called 'WaitLoss', was developed to make wait times visible and manageable for leaders to action improvements.
- The tool, which has been adopted by SCT Logistics, represents a strategic approach to managing wait times and improving operational efficiency.
- Supervisors were also upskilled with strategies to manage wait times effectively, contributing to a more supportive and efficient work environment.
- The project also demonstrated a clear engagement and co-design process with SCT, highlighting the role of leadership and governance in addressing fatigue.

Benefits to Industry

- The project produced a prototype WaitLoss tool can now be shared with the broader industry as a practical solution for managing wait times.
- The engagement process with drivers and the co-design methodology used in developing the tool provide a valuable framework for future preventative interventions.
- Key insights can be shared into the link between workplace complexity, driver engagement, and fatigue offer data-driven strategies for enhancing driver alertness and overall safety.

Next Steps

- Promotion of findings at industry forums and social media.
- Sharing tool/tool approach for wait times.
- Publishing key findings from research and data for industry.

Summary

Conclusion

Project Wide Awake addressed the persistent issue of fatigue in the heavy vehicle industry by exploring factors beyond traditional fatigue management and sleep protocols. Despite existing regulations, fatigue remains a significant concern due to its links to collisions and negative outcomes for both individuals and organisations. Funded by the National Heavy Vehicle Regulator's Heavy Vehicle Safety Initiative, the project aimed to enhance driver alertness by examining elements such as workplace simplification, physical well-being, and engagement. Partnering with SCT Logistics, the project involved direct interactions with drivers and the co-design of the WaitLoss tool, which targeted reducing idle wait times—a major source of driver frustration and disengagement. The use of wearable technology provided novel insights, and the feedback from the implementation of the WaitLoss tool was positive. Figure 13 provides another graphical representation of the systematic effects of the intervention phase of the project.

Overall, Project Wide Awake demonstrated that improving workplace conditions and addressing factors beyond sleep can significantly boost driver alertness and well-being. Moreover, complexity and engagement are linked to fatigue. It also developed and introduced a novel tool that can be shared with the greater industry, alongside the driver engagement process, problem identification, co-design and usability method for the tool prototype and testing process. This approach offers valuable insights and potential solutions for the broader heavy vehicle industry, highlighting the importance of holistic strategies in managing driver fatigue.

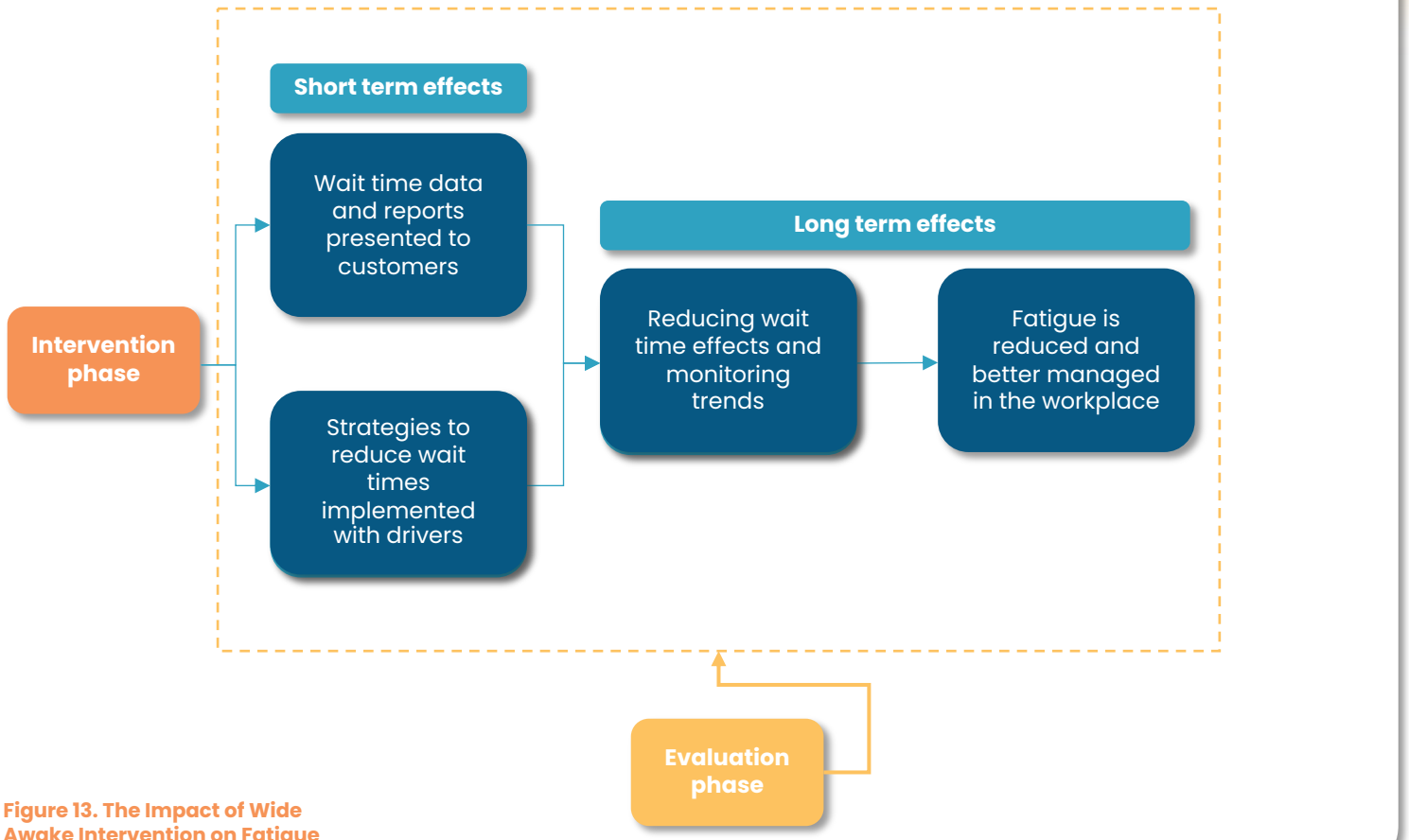


Figure 13. The Impact of Wide Awake Intervention on Fatigue

Wide Awake
End of Report