Handbook for Managers

SHIFT WORK

FIONA JOHNSTON

Shift Work

A Handbook for Managers

Fiona Johnston

Copyright

Shift Work – A Handbook for Managers

By Fiona Johnston

Copyright © 2025 by Fiona Johnston - all rights reserved.

Edited by M Pullan

No part of this publication may be reproduced, distributed, or transmitted in any form or by any means, including photocopying, recording, or other electronic or mechanical methods, without the prior written permission of the publisher, except in the case of brief quotations embodied in critical reviews and certain other non-commercial uses permitted by copyright law.

Published by Shiftwork Services

Why This Book Matters

Shift workers are a vital part of modern industry; we rely on them to keep essential services running around the clock. Yet despite their importance, shift workers often face serious challenges that affect their health, well-being and performance. As an occupational therapist I have worked extensively with shift workers and their managers, and I have seen first-hand the physical, mental, and emotional toll that poorly managed shift work can take. This book presents practical, evidence-based solutions to help organisations manage shift work in ways that support both the well-being and productivity of their employees. It is grounded in the latest research and shaped by the knowledge and wisdom of the shift workers and managers I have worked alongside over many years.

Contents

Chapter 1: Introduction to Shift Work and it's Challenges 6

Chapter 2: Sleep and Shift Work 8

Chapter 3: How Fatigue Affects Attention, Judgement, and Decision - Making..... 11

Chapter 4: Biomathematical Fatigue Modelling? 17

Chapter 5: Master Roster Design – Why This Matters 20

Chapter 6: Supporting Shift Workers – A Manager's Guide 25

Chapter 1: Introduction to Shift Work and it's Challenges

Shift work is a work arrangement where employees are scheduled to work outside of the typical 9 am to 5 pm business hours. It is common in industries such as healthcare, mining, transport, manufacturing and emergency services, where operations must continue 24 hours a day, 7 days a week. Shift work can be beneficial for employers who need to maintain a constant workforce and meet demand around the clock. However, it also brings significant challenges for workers, affecting their health, wellbeing and work-life balance.

The Prevalence of Shift Work

The global workforce is increasingly engaging in shift work due to the demands of a 24-hour economy. According to the International Labour Organization (2019), approximately 20% of workers worldwide are involved in some form of shift work.

Impact on Health and Well-Being

Since 1995 I've been visiting shift working organisations, primarily in New Zealand, and have heard first-hand the troubles and difficulties faced by shift workers. These include health problems, social challenges and the impact on overall wellbeing. Through listening to shift workers I've gained valuable insights into the unique struggles they experience and the challenges managers face in supporting their teams.

One of the primary health concerns is disrupted sleep patterns. The human body is naturally aligned with the circadian rhythm, a biological process that regulates the sleep-wake cycle, making it difficult for individuals to adjust to night shifts. Studies have shown that shift workers are at a higher risk of sleep disorders, cardiovascular diseases, gastrointestinal issues and mental health problems like depression and anxiety (Kirk et al., 2017).

Fatigue and Performance

Fatigue significantly affects workplace performance, slowing reaction times, impairing decision-making, and reducing concentration. As fatigue builds, the risk of errors, accidents and decreased productivity increases. Workers may struggle with problem-solving, communication and staying alert, which can have serious consequences in high-risk industries. Managing fatigue effectively is essential for maintaining safety, efficiency and overall job performance. Fatigue causes almost 10,000 serious workplace injuries, and figures cost the loss to the Australian economy at over $5 billion in lost productivity and healthcare costs annually (**Source:** Monash University, 2014).

Social and Family Life

Shift work also poses challenges in balancing social and family life. Many shift workers report difficulties in maintaining relationships and social connections due to the irregular hours they work. This often leads to feelings of isolation, stress and a reduced quality of life. Furthermore, the societal expectation of a 9 am to 5 pm workday can

create additional stress for shift workers who miss out on social activities or family gatherings.

Adapting to Shift Work

There are various strategies that workers and employers can adopt to mitigate the negative effects of shift work. For example, adopting better sleep hygiene practices, using lighting systems that help shift workers adjust their circadian rhythm and offering regular health checks can help improve both the physical and mental health of employees. Additionally, fostering a supportive work environment that acknowledges the unique needs of shift workers can go a long way in enhancing their well-being and productivity.

Conclusion

While shift work is necessary for certain industries, it comes with a unique set of challenges that impact the health, well-being and social lives of workers. Understanding the complexities of shift work and its effects is critical in developing effective strategies to reduce its negative impact. This booklet aims to provide guidance on how to navigate these challenges and promote better management of shift work in the workplace.

Key Action Points

- Gather feedback from workers about fatigue and quality of life
- Review current shift pattern
- Provide education about sleep, fatigue and keeping well

Further Reading

Kecklund, G. & Axelsson, J. (2020). Health consequences of shift work and insufficient sleep. BMJ, 368:m364: This article gives a clear, research-based overview of how working shifts and getting too little sleep can increase risks for heart disease, diabetes and mental health problems.

Eurofound (2021). Telework and shift work: Organisational practices, health, and work-life balance. This European-wide report looks at how shiftwork is managed in different countries and sectors. It covers its impact on worker wellbeing, stress and job satisfaction.

Chapter 2: Sleep and Shift Work

Sleep is an essential part of our daily lives, yet for many shift workers it's often the first thing disrupted due to irregular work hours. Understanding how shift work affects sleep and the well-being of employees will help managers make better decisions about rosters, workload and support services.

In this chapter, we'll explore the effects of sleep disruption on shift workers and outline strategies managers can implement to mitigate the risks and enhance employee wellbeing and performance.

What is Sleep and Why Does It Matter?

Sleep is one of the body's basic needs, just like food and water: it's the time when your brain and body take a break to recharge and repair. During sleep your brain sorts through memories, clears out waste and balances your mood. Your body heals itself and keeps important systems like your immune system and hormones, working well.

When people don't get enough good sleep it can affect their mood, focus and overall health. In New Zealand, many workers say their jobs make it hard to get a good night's sleep. Fatigue is a serious issue here—it's estimated to be a factor in about 20% of road accidents. So, making sure employees get enough sleep isn't just good for their health—it's important for safety too.

How Shift Work Affects Sleep

Shift work often means working hours that don't match the body's natural clock, which is set to be awake during the day and asleep at night. When people work nights or rotating shifts, their bodies can get out of sync, making it harder to fall asleep, stay asleep or feel rested.

Shift workers often sleep less—sometimes up to four hours each day—compared to those who work regular daytime hours. This can lead to tiredness, trouble concentrating, mood changes and higher health risks like heart disease and diabetes.

Because shift work messes with natural sleep patterns, it's especially important for managers to understand these challenges and support workers with good shift design and healthy sleep habits.

The Short-Term Effects of Sleep Deprivation

In the short term, sleep deprivation can severely impact a worker's ability to perform their job efficiently and safely. Fatigue from lack of sleep reduces attention span, impairs judgment and slows reaction times - all of which can increase the likelihood of accidents or mistakes in the workplace. Shift workers who are sleep-deprived may find

it difficult to concentrate, experience more emotional fluctuations and struggle to regulate their stress responses.

Sleep deprivation also impacts decision-making abilities. When tired, individuals are more likely to make hasty or ill-considered decisions. For workers in safety-critical jobs, this can lead to serious consequences. Managers should be aware that the impact of sleep deprivation doesn't just affect cognitive function but also emotional regulation - leading to potential workplace conflict or reduced morale.

Common Effects of Sleep Loss

Physical	**Psychological**	**Behavioural**
Fatigue	Irritability	Poor decision making
Headaches	Low mood	Reduced motivation
Low energy	Difficulty concentrating	Increased risk taking
Slowed reflexes	Mild anxiety	Microsleeps
Muscle tension	Feeling overwhelmed	Impaired judgement of time and distance

The Long-Term Effects of Sleep Debt

Prolonged sleep deprivation, often experienced by shift workers over time, can result in significant sleep debt—the cumulative deficit of sleep needed to recover. Long-term sleep debt has been linked to a range of health issues, including cardiovascular disease, metabolic problems and compromised immune function. In addition to the physical health risks, chronic sleep deprivation can lead to mental health challenges, including depression and anxiety.

Shift workers are at a higher risk for developing these long-term health problems due to the persistent disruption of their sleep patterns. The more a workers sleep schedule is altered, the greater the potential for these issues to arise.

Key Action Points

• Provide sleep education – educate staff about sleep cycles, circadian rhythm, sleep hygiene and fatigue management
• Ensure sleep-friendly rosters – minimise long shifts and back-to-back nights
• Offer nap spaces or quiet rooms – encourage 20–40 minute naps during long shifts or night shifts
• Promote a culture that values rest – discourage glorifying fatigue or "pushing through"
• Support access to mental health services – fatigue and stress are closely linked
• Minimise overtime and double shifts – prevent chronic sleep debt and burnout
• Encourage input into rostering – Improves satisfaction and helps balance personal sleep needs

Conclusion

Sleep is essential for maintaining both physical and mental health, as well as cognitive performance. For shift workers, the disruption of natural sleep patterns can lead to short-term effects like fatigue and poor decision-making, as well as long-term health problems. Managers can help mitigate these risks by implementing strategies that prioritise sleep hygiene, create sleep-friendly rosters and acknowledge the unique challenges of night work. By supporting employees in managing their sleep, managers can improve workplace performance, reduce safety risks and promote overall employee well-being.

Further Reading

Walker, M. (2017). Why We Sleep: Unlocking the Power of Sleep and Dreams.
A widely respected and accessible overview of the science of sleep, with real-world insights into the consequences of sleep loss.

Roehrs, T. & Roth, T. (2021). Sleep and Shift Work: Impacts and Interventions.
Offers a clinical perspective on how shift work affects sleep, with strategies for managing fatigue (more academic, but very relevant).

Australian Sleep Health Foundation: Sleep and Work Fact Sheets.
A collection of easy-to-read, practical resources on sleep hygiene, shift work, and fatigue management.

Chapter 3: How Fatigue Affects Attention, Judgement, and Decision - Making

As an occupational therapist, my interest lies in understanding how fatigue affects function, particularly cognitive function - including attention, judgment and decision-making. Fatigue can have a profound impact on these cognitive processes, leading to lapses in focus, slower reactions and impaired decision-making; all of which can increase the risk of accidents and affect overall performance in the workplace.

In this chapter we will review how fatigue influences cognitive functions in industries that rely on shift workers to highlight the implications for safety and productivity. By understanding these effects, we can develop strategies to minimise fatigue-related risks and promote better decision-making and performance in work environments.

Fatigue, Alcohol and Performance Impairment

Dawson and Reid (1997) asked participants to stay awake for 28 hours and tested their performance on cognitive and motor tasks at regular intervals. They compared these results to a second group who had consumed alcohol until they reached legal driving limits.

The findings were striking:
• After 17 hours awake, performance was as impaired as having a blood alcohol concentration (BAC) of 0.05% (the legal limit in some countries).
• After 24 hours awake, impairment was equivalent to a BAC of 0.10%—well over the legal limit for driving.

Comment: *A long shift can leave you as impaired as a drunk driver—without the alcohol*.

Driving

Driving is an activity that many people engage in daily, yet it is one of the most hazardous tasks when fatigue sets in. Fatigue is a leading contributor to road accidents, with the World Health Organization (WHO) estimating that approximately 20% of all road crashes worldwide are attributed to driver fatigue

When a driver is fatigued, their ability to process information and make decisions is severely impaired. Attention, a fundamental cognitive skill required for safe driving, is significantly reduced. Fatigue slows reaction times and makes it harder for drivers to maintain focus on the road, increasing the chances of missing important cues, such as traffic signals, pedestrians or hazards. Judgment, another key cognitive function, is also affected, leading to poor decision-making, such as taking risks or failing to adjust speed

appropriately for road conditions. Fatigue can also compromise a driver's ability to predict and respond to potential dangers in the environment, which further heightens the risk of accidents.

One of the most dangerous outcomes of fatigue is the occurrence of microsleeps, brief, involuntary episodes of sleep that can last just a few seconds. During a microsleep, a driver loses full awareness of their surroundings, often without realising it. These episodes, though brief, are highly dangerous, as they can lead to complete loss of control of the vehicle. Studies have shown that drivers who experience microsleeps are much more likely to be involved in fatal accidents. As fatigue increases, the likelihood of experiencing microsleeps also rises, which can be catastrophic when operating a vehicle at high speeds or in complex driving conditions.

Understanding the cognitive impairments caused by fatigue is essential for developing strategies to reduce the incidence of fatigue-related crashes. Measures such as education on the signs of fatigue, promoting adequate rest before driving and encouraging the use of fatigue management systems in vehicles can help mitigate the risks associated with driver fatigue. It is clear that fatigue alters the mental processes necessary for safe and effective driving.

When Fatigue Strikes – Unaware and Unprepared.

A notable study by Professor Drew Dawson and colleagues explored the impact of fatigue on driving using a simulator. Sleep deprived participants drove the simulator for extended periods, and one participant even fell asleep at the wheel. In this study surprisingly, the individual was unaware of falling asleep and when he woke he continued to drive as if nothing had happened.

Comment: *This illustrates that people are often poor judges of their own fatigue levels. Fatigued drivers may not recognise how tired they truly are, which can lead to dangerous decisions, such as continuing to drive despite being at risk of microsleeps or impaired reactions.*

Operating Machinery

Shift workers who operate machinery face unique challenges due to the impact of fatigue on their cognitive functions. Whether in manufacturing, mining or construction, the demands of operating complex machinery require high levels of attention, quick reaction times and precise judgment.

A shift worker who is fatigued might fail to notice a malfunctioning part of a machine or misjudge the necessary pressure or speed required to perform a task. These kinds of errors can lead to equipment damage or, in some cases, personal injury.

Control Room

In high-stakes environments like control rooms, fatigue can quietly wear down attention and judgement. Even when workers appear alert, lack of sleep can reduce attention span, slow reaction times and affect how information is processed. Decision-making becomes riskier people may miss subtle cues, make impulsive calls, or struggle to weigh options clearly.

Control rooms themselves often make things worse. They're typically quiet, warm and dimly lit conditions that can encourage drowsiness, especially during night shifts. The hum of machinery or white noise can make it even harder to stay alert, especially during the early hours of the morning when the body naturally wants to sleep.

As one shift worker put it:

"I was staring at the screen, but nothing was going in. I knew I was supposed to be monitoring but I couldn't hold the information in my head. I felt as if the lights were on, but no one was home."

Fatigue doesn't always look dramatic—but in a control room, even small slips in focus can have serious consequences.

Customer Service

Customer service and call centre roles demand constant focus, quick thinking, and strong communication—often while juggling multiple tasks or speaking with several customers in quick succession. Fatigue can make this kind of mental juggling more difficult, leading to slower responses, mistakes or tone that unintentionally comes across as blunt or impatient. Even experienced staff can find it difficult to stay sharp during long or late shifts, especially when pressure is high and the pace doesn't slow down.

As one worker shared:

"By the second half of the shift, I was answering calls on autopilot. I'd hang up and realise I couldn't even remember what the customer had said."

The Impact of Sleep Loss on Cognitive Function
Research by Van Dongen et al. (2003) examined how chronic sleep restriction affects cognitive performance. The study found that individuals who slept six hours per night for two weeks performed as poorly on attention and reaction time tests as those who had been awake for 24 hours straight. Importantly, participants were often unaware of how much their performance had declined, highlighting the hidden dangers of chronic sleep deprivation.

Comment: *This study highlights how easy it is to underestimate the effects of ongoing sleep restriction. People may appear fine, but their thinking, reaction time, and decision-making can be significantly impaired—without them realising it.*
Could this be happening in your team?

Healthcare
Healthcare workers are particularly susceptible to the cognitive effects of fatigue, which can compromise attention, judgment and decision-making. These cognitive abilities are critical in clinical settings, where errors can have serious consequences. Long working hours, shift patterns and the inherent stress of healthcare roles can lead to fatigue, impairing the ability to focus and make timely, accurate decisions.

Fatigue is a Risk for Nurses
Nurses often work long shifts, rotating rosters and back-to-back nights—leaving little time for recovery. The New Zealand Nurses Organisation (NZNO) has consistently warned that unsafe staffing and poor rostering are key drivers of fatigue. This impacts not just nurse wellbeing, but the safety and quality of care.

As the NZNO put it: “Nurses are exhausted. They’re stretched thin, often working double shifts or short-staffed. Fatigue is putting patients and nurses at risk every day.”

Comment: *Are the people who spend the most time with patients getting the rest and support they need?*

It’s a Problem for Doctors Too
Doctors working long shifts and overnight hours face serious risks from fatigue. The New Zealand Resident Doctors’ Association (NZRDA) has consistently raised concerns about unsafe rosters, warning that tired doctors are more likely to make errors that can harm both themselves and their patients.

As the NZRDA puts it: “Fatigue is not just a wellbeing issue—it’s a patient safety issue.

Long hours and inadequate recovery time increase the risk of mistakes, burnout, and harm."

Comment: *If this level of risk isn't acceptable for doctors, should it be acceptable for your team?*

Aviation

Aviation has been at the forefront of fatigue research due to the industry's inherent risks and high safety standards. Early studies on fatigue primarily focused on pilots, air traffic controllers and cabin crew, whose cognitive performance is critical for safety. These studies examined the effects of extended duty hours, circadian rhythm disruptions and sleep deprivation on attention, judgment and decision-making. Findings from aviation research were pivotal in developing strategies like duty-hour regulations and Fatigue Risk Management Systems (FRMS), which have since been adopted in other sectors such as healthcare and transportation.

Cognitive fatigue in aviation is especially concerning because it reduces situational awareness, impairs the ability to respond to emergencies and increases the likelihood of errors. For example, fatigue has been linked to several high-profile incidents where decision-making and communication broke down. Additionally, environmental factors such as the monotony of long-haul flights, disrupted sleep patterns from time zone crossings and the sustained concentration required in cockpit and control tower settings exacerbate the issue. Aviation continues to lead the way in developing solutions for managing fatigue, including advanced monitoring technologies and improved scheduling practices to mitigate its impact.

Conclusion

Fatigue has far-reaching effects on cognitive functions, impacting a wide range of tasks performed by shift workers. Whether driving, operating machinery, working in customer service, providing healthcare, working in a control room or flying planes, cognitive fatigue can lead to serious errors and accidents. Employers are encouraged to take proactive steps to address fatigue by implementing policies that encourage sufficient rest, shifts to allow for recovery and educating workers about the importance of sleep and fatigue management. By understanding and addressing the impact of fatigue on cognitive function, we can improve workplace safety and productivity for shift workers across various industries.

Key Action Points

- Avoid long stretches of night shifts
- Be alert to lapses of attention, reactions times and fatigue related errors
- Support taking breaks and consider having a napping policy.

Further Reading

How to Combat Decision Fatigue: Wisdom University, 2023. A practical guide for understanding how decision fatigue develops and how to prevent mental overload in fast-paced work environments.

Critical Thinking for Managers: Structured Decision-Making and Persuasion in Business – Radu Atanasiu, 2021. A clear, simple book for managers to improve judgement and decision-making under pressure.

Managing Fatigue in the Workplace: Safe Work Australia, 2022: A workplace-focused guide on recognising fatigue and how it impacts performance and safety, with clear tips for reducing risks.

Chapter 4: Biomathematical Fatigue Modelling?

Rosters might look good on paper, but fatigue doesn't always follow the plan. A shift can tick all the boxes—legal hours, staff coverage, start and finish times—but still leave workers exhausted, distracted and prone to mistakes. That's where biomathematical fatigue modelling comes in. These models help managers see beyond the surface, using sleep science to predict when fatigue is most likely to affect performance. It's not about policing workers—it's about designing smarter systems that support alertness, safety, and better decision-making.

What Is Fatigue Modelling?
Fatigue models are tools that forecast when a person is likely to be mentally fatigued, based on their sleep history, shift schedule and circadian rhythm (the internal body clock). They draw on decades of research to give a rough, but reliable picture of when alertness dips and fatigue peaks.

These Models Typically Factor In:
• How much sleep someone has had recently
• What time their shift starts and finishes
• How long they've been awake
• What time of day or night it is

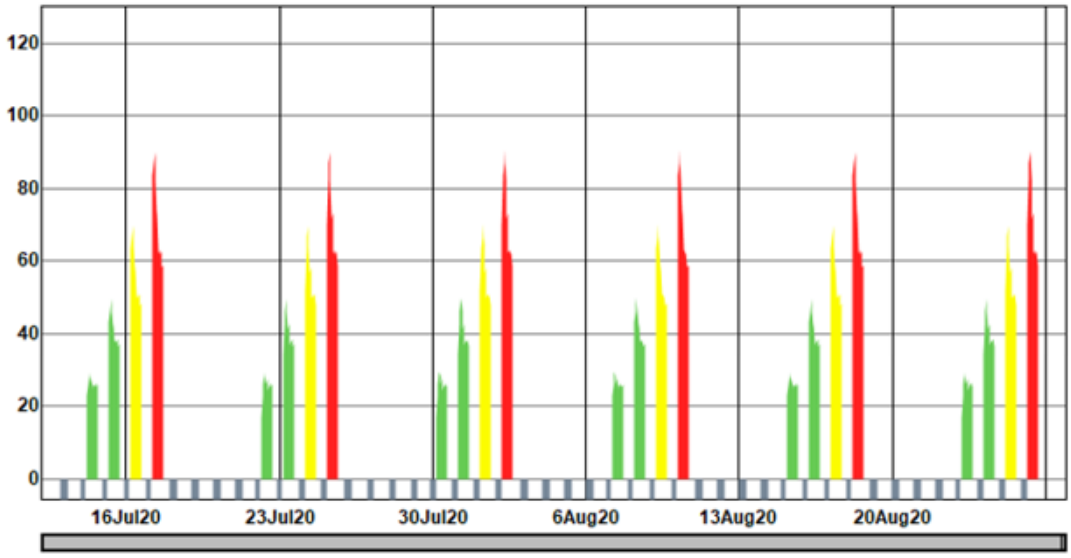
You could think of a fatigue model like a weather forecast. It doesn't predict exactly how someone will feel, but it highlights risk areas—times when workers are more likely to feel sleepy, make mistakes or have slower reaction times.

What Does It Look Like?
Here's an example of a simple fatigue risk profile across a 7-day shift pattern, based on a widely used fatigue model like FAID.

The fatigue chart illustrates a common pattern in shift work: this person works two-day shifts followed by two-night shifts. The two green bars show that fatigue is already high in the early morning when they begin their day shifts—this is a time when the body is naturally still waking up, especially if sleep before an early shift was limited.

However, the impact becomes significantly more pronounced during the night shifts. On the first night, fatigue increases sharply; and by the second night shift, the fatigue score exceeds 80. A score of 80 or higher is considered equivalent to the cognitive impairment seen in someone who is over the legal blood alcohol limit for driving. This highlights the serious risk to both safety and performance during these hours.

Fatigue levels For Two Days and Two Nights on Shift Work.



How Well Do Fatigue Models Work?

Fatigue modelling tools like the one used to produce this chart, offer a practical and evidence-based way to identify fatigue risk across a roster. One of their key strengths is turning complex sleep science into clear, visual information that can support better decision-making. These models help highlight patterns that may otherwise go unnoticed—such as the cumulative impact of night shifts or early starts—and can be especially useful in conversations around roster design and worker safety. While they don't capture individual differences or actual sleep behaviour, they are built on well-established research and provide a solid starting point for proactive fatigue management. When used alongside real-world feedback and professional judgement, they're a powerful tool for improving safety and performance in shift work settings.

To show how these models make a difference in real workplaces, here's what one union member shared about their experience:

"Using the fatigue model helped us see the real risks clearly. It cut through all the debates and made it easier to plan better rosters."

Conclusion

Fatigue is a predictable and manageable risk in shift work. By understanding when and why fatigue occurs, and using tools like modelling software to support good planning, organisations can make meaningful improvements to safety, performance and worker well-being. While no tool replaces real-world insight or individual experience, combining evidence with practical strategies helps create a safer and more sustainable work environment.

Key Action Points

• Biomathematical tools estimate likely fatigue levels and highlight high risk times in a roster

• They are grounded in sleep science offering an objective way to assess the fatigue associated with hours of work

• They provide a conservative estimate of fatigue as they assume the worker sleeps when time is available.

Further Reading

Fatigue Management: A Manager's Guide to Reducing Risk and Improving Performance – Paul Stanley, 2022. Explains how biomathematical models can predict fatigue levels and help managers make safer decisions about rostering and work hours.

Managing Shift Work and Workplace Fatigue: Safe Work Australia, 2023. A clear, practical resource for understanding fatigue risks and how modelling tools (like FAID) can support better shift planning. Available at: safeworkaustralia.gov.au

Understanding and Applying Biomathematical Fatigue Models: Transport Safety Victoria, 2021. Short guide for managers on how fatigue models work, including how to read and respond to fatigue risk predictions. Available at: transportsafety.vic.gov.au

Chapter 5: Master Roster Design – Why This Matters

Roster design is one of the most debated and often frustrating topics in shift work. Everyone has a different idea of what a “good” roster looks like. Managers want maximum coverage with minimal staff. Unions want fairness, safety and predictability. And workers? They want something that fits around real life, like kids, study, second jobs, community commitments, or just getting to their weekend plans without needing three days to recover.

It’s no wonder that designing a master roster can feel like trying to solve a Rubik’s cube in the dark. But when you get it right, the payoff is huge, for safety, performance and morale.

I often get asked, “What’s the ideal roster? There must be a perfect one out there, right?” I wish I had a magical answer. A golden template. The holy grail of shift work.

But the truth is, there’s no one-size-fits-all. What works brilliantly in one workplace can fall apart in another. The “ideal” roster depends on the type of work, staffing levels, health and safety risks, operational demands—but most importantly, the people doing the job.

That’s why best practice in master roster design isn’t about finding the perfect pattern. It’s about using good principles to build something that’s fair, sustainable, safe—and flexible enough to work in the real world.

So what does best practice actually look like? It starts with recognising that a good roster has to balance three big things:

1. Staff needs – including rest, recovery, predictability and some work-life balance. If people can’t manage their lives around the roster, burnout isn’t far behind.
2. Business needs – making sure there are enough skilled people at the right times to get the job done efficiently. This includes covering peak demand, being responsive and avoiding excessive overtime.
3. Health and safety – protecting workers from the known risks of fatigue. This means avoiding long stretches of work without breaks, limiting night shifts in a row, allowing enough recovery time and respecting circadian rhythms.

When a roster hits all three, it’s not perfect—but it’s functional, fair, and far more likely to succeed. When one of these areas is ignored, problems creep in: rising error rates, absenteeism, poor morale; or even serious incidents.

Pros and Cons of Common Shift Patterns

Day-Day-Night-Night (DDNN)

Pros:
• Predictable cycle, easy to plan life around
• Blocks of consecutive day or night shifts help focus on one routine at a time
• Some days off after night shifts for recovery

Cons:
• Switching quickly from day to night disrupts sleep patterns
• Night shifts cause more fatigue and health risks
• Recovery time may still feel short after night shifts

Night-Night-Day-Day (NNDD)

Pros:
• Starts with nights, so recovery happens during day shifts
• Predictable routine similar to DDNN
• Some workers prefer beginning with night shifts

Cons:
• Same sleep disruption risks as DDNN
• Fatigue from night shifts can affect day shift performance
• Adjustment between shift types can be tough

Five Nights in a Row

Pros:
• Consistent night routine for a week
• Longer recovery period after the block
• Fewer shift changes, which can reduce stress

Cons:
• High risk of fatigue buildup over five nights
• Social and family life can suffer during the long night block
• Health risks linked to long-term night work increase

Fixed Shifts (always days or always nights)

Pros:
• Stable daily routine with less disruption to sleep
• Easier to develop good sleep habits
• Better work-life balance if the shift suits the worker

Cons:
• Limited flexibility; can be boring or isolating
• Fixed night shifts still carry health risks
• May not meet all staffing needs

Rotating Shifts (e.g., weekly or monthly rotation)

Pros:
• Fair sharing of day and night work among staff
• Variety can reduce boredom
• Exposure to different shifts can prevent burnout on one shift type

Cons:
• Hard to get good, consistent sleep due to frequent changes
• More fatigue and potential errors from shift switching
• Can disrupt family and social life

Shift Lengths:

8-hour shifts
Pros: Easier to stay alert, better for health, less fatigue
Cons: More shift handovers, more commuting days

10-hour shifts
Pros: Fewer workdays per week, longer breaks between shifts
Cons: Can still be tiring, less recovery during workdays

12-hour shifts
Pros: More days off, fewer handovers, better continuity of care
Cons: High fatigue risk, harder to stay alert, more accidents possible

What I Have Learned From Industry About Roster Design

From my experience, the key to successful roster design is a high level of staff engagement throughout the process. Involving staff in selecting, voting on and regularly evaluating the roster ensures it meets both their needs and the organisation's goals. This collaborative approach helps balance business requirements, workplace safety and employee welfare. When staff feel heard and involved, the roster is more likely to be fair, workable and sustainable, leading to better outcomes for everyone.

Another important principle is recognising the organisation's fatigue tolerance, the level of fatigue risks the business is willing and able to accept. In high-risk environments, fatigue tolerance should be low, meaning rosters need to be more conservative and recovery time prioritised. In lower-risk settings there may be more flexibility. Defining this tolerance should be a shared process, involving the whole team to ensure that roster decisions reflect the real risks and values of the team.

Shift Workers' Comments About Roster Patterns

- I prefer forward rotation because it aligns better with my natural sleep cycle.
- Backward rotation gives me a longer block of time off, which is great for family or personal time.
- Fixed shifts can be tough, especially if I get stuck on nights for a long period.
- Compressed shifts help me get more days off, but the long hours can be exhausting.
- Flexibility in my shift pattern would help me manage my work-life balance better.
- I feel most fatigued when I'm working nights and then have to switch straight into a day shift.
- Having a say in my roster would make a huge difference to my well-being and motivation.

Using Fatigue Modelling in Roster Design

Biomathematical fatigue modelling is a valuable tool for predicting when workers are most likely to experience fatigue based on their shift schedules. This model helps managers design rosters that minimise fatigue, improve worker performance and reduce safety risks (Kecklund & Axelsson, 2016).

Common Pitfalls in Roster Design. Poorly designed rosters can lead to fatigue, dissatisfaction and increased safety risks. Here are some common mistakes to avoid:

- Too many consecutive night shifts – increases sleep debt and fatigue, making recovery harder.
- Quick shift turnovers – not allowing enough time between shifts leads to inadequate rest. (e.g., finishing late and starting early)
- Unpredictable or last-minute changes – makes it difficult for workers to plan rest, family time and recovery.
- Ignoring worker input – staff are more likely to cope with a roster they have had some say in.
- No consideration for fatigue risk – simply filling shifts without factoring in circadian rhythms and rest opportunities can reduce performance and safety.

Comment: *A well-planned roster balances business needs with worker well-being, improving both productivity and retention*.

Key Action Points

• Ensure sufficient recovery time between shifts.
• Involve workers in the roster design process to improve satisfaction and reduce fatigue.
• Use fatigue modelling tools to optimise shift schedules and minimise the risk of fatigue-related incidents.

Further Reading

Good Practice Guidelines: Managing the Risk of Fatigue in the Workplace – WorkSafe New Zealand, 2023. New Zealand-focused guidance on how to assess fatigue risk and design safer rosters across sectors like healthcare, transport and emergency services.

Fatigue, Shift Structures and Working Hours: WorkSafe WA, 2025

Covers key principles for structuring shifts, including maximum shift lengths, rest periods and forward-rotating.

Chapter 6: Supporting Shift Workers – A Manager's Guide

Over the years, I have observed various strategies that managers have used to help shift workers stay healthy, safe and engaged. These are not one-size-fits-all solutions, but practical approaches that have proven beneficial in the workplaces I have worked with. By implementing these strategies employers can improve workers' performance, reduce fatigue and foster a culture of health and wellbeing.

Providing Rest Spaces

A key strategy I've often seen is the provision of rest spaces for shift workers. When workers are able to take short, uninterrupted naps during breaks, it makes a significant difference in reducing fatigue and enhancing alertness (Smith & Jackson, 2020). In my experience, quiet rooms with comfortable seating, dim lighting and no distractions provide workers with the best opportunity to rest. In some workplaces, this has led to noticeable improvements in overall productivity, safety and employee morale.

Encouraging Power Naps

One of the most effective strategies I've come across is encouraging power naps. In many of the organisations I have worked with, managers have seen positive outcomes from allowing staff to take short naps, 20 – 40 minutes, during their shifts. Research supports that even brief naps can boost cognitive function and reduce feelings of fatigue (Dawson, 2017). It's important for managers to normalise napping as a tool for improving performance, rather than seeing it as time wasted. By actively promoting naps, some organisations have found that their employees are better equipped to stay alert and engaged.

"A well-timed power nap might just be the cheapest safety investment we can make — boosting alertness, reducing risk, and improving performance across the board. It's backed by research and it works."
Simon Smith, Operations Manager

Access to Healthy Food

Nutrition is another area where I've seen improvements. In the workplaces I've worked with, providing workers with access to healthy meals and snacks has a major impact on their energy levels and performance. Offering a variety of balanced foods such as fruit, vegetables, lean proteins and whole grains helps shift workers maintain consistent energy throughout their shifts. I've observed a shift towards healthier options, such as protein bars, nuts and fresh fruit in staff rooms, and employees have responded positively, reporting feeling more energetic and focused (Jones, 2018).

Worker Input into Rosters

One of the most important factors I've seen for maintaining healthy, engaged shift workers is ensuring that they have input into their rosters. Some organisations have

found that when workers have a say in their schedules, they feel more in control of their work-life balance. This involvement helps reduce stress, improve job satisfaction and prevent burnout. Regularly gathering feedback from employees about their preferences for shift patterns allows managers to create schedules that accommodate the workforce's needs while still meeting business requirements.

"When workers have a say in their rosters, it's not just about fairness — it's about creating schedules that work for everyone. Happier, well-rested staff lead to better performance, fewer errors and a safer workplace."
Sarah Johnson, HR Director

Managing Caffeine Use

Caffeine is often a go-to for many shift workers seeking to stay alert, however, I've observed that it can be a double-edged sword. When used correctly, caffeine can help improve focus and energy, but overuse, especially late in the shift, can interfere with sleep and lead to negative long-term effects. Providing education on the optimal use of caffeine can help employees maintain alertness without it impacting sleep.

Caffeine and Naps: A Powerful Combination

Research has shown that combining caffeine with a short nap can be particularly effective for shift workers. A study by Horne and Reyner (2001) found that a "caffeine nap", where workers consume caffeine followed by a 20-minute nap, significantly improves alertness and cognitive performance. The caffeine takes about 20 minutes to begin taking effect, which aligns with the timing of a short nap. This combination has been shown to provide a boost in energy and reduce feelings of fatigue without the negative impact on sleep that can result from excessive caffeine consumption (Dawson, 2017). Incorporating this strategy can help shift workers stay alert and productive throughout their shifts.

Comment: *When used wisely, caffeine can be a tool for shift workers to stay alert. But remember, the real secret lies in balance. Combine caffeine with strategic rest and you can beat fatigue and stay sharp throughout the shift.*

Supporting Good Sleep Habits

As many of my clients are shift workers, sleep is a frequent topic of conversation. Maintaining good sleep habits can be challenging for shift workers, but I've seen many organisations take active steps to support their employees. Simple things, like providing blackout curtains to block daylight, reducing exposure to blue light from screens before bed and creating a quiet environment for rest have proven helpful (Smith & Jackson, 2020). I've also observed that when managers encourage their employees to prioritise

sleep and provide education on sleep hygiene, it leads to better health and improved performance at work.

Creating a Fatigue-Aware Workplace Culture
In my practice I've often worked with organisations that have successfully created a fatigue-aware culture. This culture begins with leadership, as it's crucial for managers to lead by example and promote open discussions about fatigue. In these workplaces, fatigue is not seen as a personal failing but a shared concern that requires collective management. Training employees to recognise signs of fatigue in themselves and others and to take action when needed has helped reduce fatigue-related incidents and promote a safer, more productive work environment (Dawson, 2017).

While these strategies are just a few of the many I have seen in my practice, they provide valuable insights into how to support shift workers. The key is to approach these efforts with flexibility and a genuine concern for the health and wellbeing of your employees. By making small changes and fostering a culture that supports shift workers, businesses can create a healthier, more engaged workforce.

Key Action Points
• Encourage rest and naps to reduce fatigue and improve alertness. Create spaces where employees can rest comfortably during breaks.
• Promote healthy eating by providing nutritious food options during shifts to maintain energy and focus.
• Prioritise sleep and fatigue awareness by educating workers on good sleep hygiene and recognising the signs of fatigue.
• Provide shiftwork lifestyle training that includes sleep and fatigue management, worker's responsibilities, meal planning, managing stress, the importance of exercise and maintaining a healthy work-life balance.
• Remind employees that we are all expected to turn up fit for work – that includes being rested enough to work safely.

Further Reading
Managing Shift Work: Strategies for Promoting Employee Wellbeing – Brown & Lee, 2023. Covers how managers can support the mental, physical and social wellbeing of shift workers, including communication and recovery strategies.

Sleep and Fatigue Management for Workplaces: Sleep Health Foundation, 2022
A set of workplace handouts and recommendations on how to support shift workers sleep health through education, policy and workplace culture.

Our Key Services

At Shiftwork Services we provide a range of services designed to meet the needs of our clients, ensuring their success and well-being.

1. Roster Design and Optimisation
Tailored roster solutions to improve work-life balance, reduce fatigue, and enhance overall efficiency in your organisation.

2. Fatigue Audits
We offer comprehensive fatigue audits with a full report, using biomathematical fatigue modelling software to support your decision-making and help develop a tailored fatigue management plan.

3. Workplace Wellness Programs
Initiatives focused on improving physical and mental health, promoting a healthier, more productive workplace.

4. Training and Development
We offer a range of seminars and workshops to support frontline staff and shift workers in managing the shift work lifestyle. We also provide training for managers to help them understand what their teams need to stay safe, healthy and alert on the job.

5. Employee Engagement Surveys
Assessing employee satisfaction, fatigue levels and well-being to help you make informed decisions and improve workplace culture.

Contact us today to learn more or book a consultation.

We'd love to support your team. Whether you need a one-off workshop or an ongoing program, we can help you build a healthier, more engaged workforce.

fiona@shiftwork.co.nz
www.shiftwork.co.nz