

The First Night Effect - White Paper

Notice

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Glossary / Definitions

Adenosine:	A chemical compound that builds up in the brain during wakefulness and creates a pressure to sleep, known as sleep pressure.
Blue Light:	A type of light with a short wavelength that is known to interfere with melatonin production and disrupt sleep patterns.
Blue Light Blocking Glasses:	Eyewear designed to filter out blue light from screens and other sources, reducing its impact on melatonin production and sleep quality.
Caffeine:	A stimulant found in coffee, tea, and other beverages that blocks adenosine receptors in the brain, reducing sleep pressure and making it harder to fall asleep.
Chronotherapy:	A treatment strategy that involves adjusting sleep and wake times to reset the body's internal clock, often used for treating circadian rhythm disorders.
Chronotype:	An individual's natural preference for activities and sleep at certain times of the day, such as being a morning person (early bird) or an evening person (night owl).
Circadian Rhythm:	The natural, internal process that regulates the sleep-wake cycle and repeats roughly every 24 hours.
CLD (Catching Little Dreams):	The organization that produced this white paper for citizenM hotels, focusing on sleep advice and research.
Cortisol:	A hormone often related to stress that follows a diurnal cycle, peaking in the early morning and influencing the sleep-wake cycle.
Hypnogram:	A graphical representation of the stages of sleep as they occur throughout the night, used to analyse sleep patterns and diagnose disorders.
Insomnia:	A common sleep disorder characterized by difficulty falling asleep, staying asleep, or waking up too early and not being able to go back to sleep.
Jet Lag:	A temporary sleep disorder that occurs when a person travels across multiple time zones and their internal circadian rhythm is out of sync with the local time.
Light Therapy:	A treatment used to adjust circadian rhythms and treat certain sleep disorders by exposure to artificial light that mimics natural sunlight.
Melatonin:	A hormone produced by the pineal gland in response to darkness, signalling the body that it is time to sleep.
NREM (Non-Rapid Eye Movement) Sleep:	The phase of sleep that includes stages 1-3, with stage 3 being deep sleep. This phase is characterized by slower brain waves and is crucial for physical restoration.
Polysomnography:	A comprehensive recording of the physiological changes that occur during sleep, often used to diagnose sleep disorders.
REM (Rapid Eye Movement) Sleep:	The phase of sleep characterized by rapid movement of the eyes, increased brain activity, vivid dreams, and temporary muscle paralysis. It is essential for cognitive functions like memory consolidation.
Restless Leg Syndrome (RLS):	A condition that causes an uncontrollable urge to move the legs, usually due to an uncomfortable sensation. It typically happens in the evening or nighttime hours when a person is sitting or lying down.
SCN (Suprachiasmatic Nucleus):	A group of cells located in the hypothalamus that serves as the body's master clock, regulating the circadian rhythms, including sleep-wake cycles.
Sleep Apnea:	A potentially serious sleep disorder in which breathing repeatedly stops and starts during sleep. It can lead to fragmented sleep and decreased oxygen supply to the body.
Sleep Architecture:	The structure of the various sleep stages, including REM and NREM sleep, over a typical night's sleep. It is often represented as a hypnogram.
Sleep Hygiene:	Practices and habits that are conducive to sleeping well on a regular basis. This includes maintaining a consistent sleep schedule, creating a restful environment, and avoiding caffeine and electronics before bedtime.
Sleep Inertia:	The grogginess and disorientation that occurs upon waking from a deep sleep, often affecting short naps or abrupt awakenings.

Sleep Latency:	The amount of time it takes to transition from full wakefulness to sleep. It is often used as an indicator of sleep health.
Sleep Pressure:	The physiological drive to sleep that builds up during wakefulness due to the accumulation of adenosine in the brain.
Social Jet Lag:	The mismatch between an individual's biological clock and their social obligations, leading to a sleep deficit during the workweek that is often "repaid" on weekends.
Thermoregulation:	The process that allows the human body to maintain its core internal temperature, affecting sleep quality and the ability to fall asleep.
White Noise:	A consistent, unobtrusive sound, like the sound of a fan or static, used to mask background noise and aid sleep.
Zeitgebers:	External cues or 'time givers' are known as Zeitgebers, examples include circles of light and dark, watches and clocks, mealtimes and social routines etc.

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1 Executive summary

Catching little dreams has been engaged by citizenM hotels to provide a white paper and scientific research-based advice and sleep schedules for five different traveller demographics.

This white paper will cover topics as agreed with citizenM hotels and a summary of these topics and the findings are below:

Importance of Sleep:

Sleep is a fundamental component of human health, essential for memory consolidation, immune function, and emotional stability. Insufficient sleep is linked to a range of health issues, including cardiovascular diseases, diabetes, and mental health disorders. Adults should aim for between seven to nine hours nightly to achieve sufficient sleep. *'The Centres for Disease Control stipulates that adults need seven hours of sleep or more per 24 hours. Routinely sleeping less than six hours a night weakens your immune system substantially increasing your risk of certain forms of cancer. Insufficient sleep appears to be a key lifestyle factor linked to your risk of developing Alzheimer's disease.'* (Walker, 2018)

The white paper found:

The amount of sleep that adults achieve on a nightly basis varies between countries and locations. *On average Brits are only getting 5.91 hours of sleep a night, this is down from 6.11 in 2022 and 6.19 in 2021. Only 36 per cent said their sleep was 'good.'* (Index, 2023) Whereas in the United States, this is seemingly different. *Americans usually have around an average of 6.8 hours of sleep each night. This is more than an hour less than the average sleep they got in 1942 of 7.9 hours – 29% of Americans get at least eight hours of sleep, while 14% only get five hours of sleep.* (CFAH.org, 2024) citizenM wants to ensure their guests can hit their sleep goals during their stay.

The role of your sleep environment:

Hotels around the world are adding speciality sleep experiences ranging in cost from \$300 - \$2,500 per night but a good night's sleep doesn't need to be complicated or over-expensive. The sleep environment, encompassing factors such as ambient light, noise levels, temperature and comfort plays a crucial role in determining the quality and duration of our sleep:

- **Light:** Light, both natural and artificial, influences our circadian rhythm, signalling the body when it's time to wake up or wind down for sleep. The pervasive presence of blue light in our modern lives, emitted primarily by screens such as smartphones, tablets, and computers, has emerged as a significant disruptor of our sleep patterns. Blue light, with its short wavelength and high energy, interferes with our body's natural production of melatonin, the hormone responsible for regulating sleep-wake cycles. Effective management of blue light will ensure that melatonin production isn't inhibited.

Ensuring the room is as dark as possible during sleep onset prevents disruption of circadian rhythms and aids sleep. citizenM provides a curtain and blind in the room which when used simultaneously create a blacked-out room conducive for sleep.

- **Noise:** Noise disturbances in the sleep environment can disrupt sleep continuity and affect sleep architecture, leading to fragmented rest and diminished sleep quality. *'Loud noise disturbances can cause severe sleep fragmentation and disruption, which in turn can have negative impacts on your physical and mental health. Research even suggests that noise at low levels can cause you to shift to a lighter sleep stage or wake up momentarily. You should strive to keep your bedroom as quiet as possible by blocking outside noises. The whir of a fan or a soothing white noise machine can effectively mask other sounds and help you fall asleep.'* (Rehman, 2024) citizenM's unique building structure goes a long way to avoiding noise disturbances as the rooms have been soundproofed during construction.
- **Temperature:** Temperature plays a huge role in helping our bodies get ready for sleep. Moreover, temperature and comfort levels in the sleep environment directly impact our ability to fall asleep and stay asleep throughout the night. *'The temperature of your bedroom can make a significant difference to your sleep quality. The best room temperature for sleep is approximately 65 degrees Fahrenheit (18.3 degrees Celsius). This may vary by a few degrees from person to person, but most doctors recommend keeping the thermostat set between 65 to 68 degrees Fahrenheit (15.6 to 20 degrees Celsius) for the most comfortable sleep.'* (Rosen, 2024) citizenM in room iPad and award-winning app allow you to set the exact temperature of the room allowing patrons to once again achieve the perfect sleep environment.
- **Comfort:** Having a comfortable mattress to sleep on and soft pillows will help with comfort and ultimately quality of your sleep. *'The bedding in your sleep kit needs to be breathable so that you don't experience any unwelcome changes in temperature. You need to be cool under the covers, and if it gets too stuffy and warm under there it will interfere with your sleep.'* (Littlehales, 2016) citizenM provides extra-large king-size beds with ultra comfortable mattresses, luxury duvets topped with the finest European linens and soft pillows for a comfortable sleep space.

Sleep Pressure and Adenosine: Sleep pressure, governed by the accumulation of adenosine in the brain, plays a vital role in regulating our sleep-wake cycle and ensuring restorative sleep. The buildup of adenosine in the brain creates sleep pressure, a key driver for sleep. Adenosine, a by-product of cellular metabolism, gradually builds up in the brain throughout the day, reaching its peak by evening. As adenosine levels increase, it binds to receptors in the brain, promoting drowsiness and signalling the body's need for rest. Managing factors that affect adenosine, such as caffeine intake, is crucial for maintaining healthy sleep patterns.

Caffeine: *‘Caffeine has an average half-life of five to seven hours. Let’s say you have a cup of coffee after your evening dinner around 7.30 PM. This means that by 1.30 AM 50% of that caffeine may still be active and circulating throughout your brain tissue. Most people do not realise how long it takes to overcome a single dose of caffeine and therefore, fail to make the link between the bad night of sleep we wake from in the morning and the cup of coffee we had 10 hours earlier with dinner.’ (Walker, 2018)*

Napping: Naps can be a great way to recharge when you’re lacking sleep while travelling, but it’s crucial to avoid excessive napping even if you have travelled through several time zones and are feeling the effects of jet lag. Napping too late in the afternoon or evening can disrupt your overall sleep pattern as the release of sleep pressure means falling asleep at bedtime could be more challenging. citizenM will share this advice via the sleep schedules to leave guests fully informed.

Understanding your chronotype: Sleep chronotypes refer to an individual’s natural inclination towards certain sleep patterns, influencing when they feel most alert and when they prefer to sleep. Your sleep chronotype is genetically preconditioned. citizenM will help their patrons to identify their individual sleep chronotype so they can be aware of when they should be winding down for sleep and what time they should start their day, according to their genetic preferences.

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- **Chronotype 1: morning types (M Types)**

M types make up around 15% of the population. *‘M-types (morning types) go to bed and wake up early and achieve their peak mental and physical performance in the early part of the day.’ (Montaruli A, 2021)*

A good schedule for an M-type could be:

Awake:	5.00 AM - 6.00 AM
Most productive between:	9.00 AM - 2.00 PM
Bedtime:	9.00 AM -10.00 PM

- **Chronotype 2: somewhere in-between**

This chronotype makes up about 55% of the population.’ People with this intermediate chronotype tend to follow the sun. They do well with traditional office hours but also have no problem maintaining a social life in the evenings.’ (Rehman, 2024) This intermediate sleep chronotype exhibits characteristics of both early birds and night owls. Individuals with this chronotype typically find themselves most alert and productive during the late morning and early

afternoon hours, experiencing a gradual rise in energy levels as the day progresses.

A good schedule for the in-betweener could be:

Awake: 6.00 AM - 7.00 AM
Most productive between: 10.00 AM - 2.00 PM
Bedtime: 10.00 PM - 11.00 PM

- **Chronotype 3 – evening type (E Types)**

Night owls are referred to as E-types and make up 15% of the population. *'E-types (evening types) get up and retire later and reach their best performance during the second half of the day.'* (Montaruli A, 2021)

A good schedule for an E-type could be:

Awake: 7.30 AM - 9.00 AM
Most productive between: 1.00 PM - 5.00 PM
Bedtime: midnight - 1.00 AM

Impact of travel on various travel personas: The white paper identifies five traveller personas—Business/Corporate Traveller, Working Parent, Overseas Traveller, Neurodivergent Traveller, and Social Traveller. Each persona faces unique sleep challenges and customised advice will be provided to address their specific needs within the sleep schedules. citizenM will create bespoke sleep schedules with tailored advice, offering practical solutions and methods to help the different traveller types to cope with these challenges and achieve their best night's sleep.

The Business / Corporate Traveller: *'Fatigue has a massive economic impact, costing employers billions of dollars a year. It is estimated that reductions in productivity and motivation, along with health care costs related to fatigue, cost individual employers around \$1967 annually per employee. When these losses in productivity are added up, fatigue at work costs companies in the U.S. around \$136.4 billion dollars a year.'* (Newsom, 2023) *The business traveller may be suffering from work-related stress/anxiety and this can affect their ability to unwind. Cortisol is a stress hormone and there's no question that 'chronically elevated cortisol contributes to sleep disruptions and other health problems. The challenge for many of us is to keep cortisol levels from veering too high'.* (Breus, <https://sleepdoctor.com/>, 2024). Their diet and exercise options whilst away may be having an impact on their sleep, as well as poor management of blue light consumption.

The Working Parent – Young Parent: Face all the same challenges found with a business traveller, however they can face additional challenges when staying in a hotel without their family. Emotional separation brought about by being away from their family can evoke feelings of loneliness and emotional separation, impacting their ability to relax and sleep peacefully. Parental responsibilities may be weighing heavy on their minds, especially if they have left the other parent at home to cope with family life alone. They

may arrive at the hotel sleep deprived due to a number of family circumstances and find it more challenging to unwind than the other traveller types.

The Overseas Traveller: When your biological clock becomes desynchronised from external zeitgebers the disruption of our biological rhythm and its effects are known as 'jet lag'. This will be the main challenge for our overseas traveller. Overseas travellers will experience various degrees of jet lag. One of the factors affecting the severity of the jet lag is the direction of travel. *'It was shown that American servicemen took on average about three days to recover from the symptoms of jetlag after travelling from Europe to the USA (East to West, phase delay), and on average eight days when travelling from the USA to Europe (West to East, phase advance). Phase advance is more difficult for the body to adjust to than phase delay.'* (Green, 2012) They may also be missing home or having trouble adjusting to the new culture so there must be consideration for this within their sleep schedules.

The Neurodivergent Traveller: The spectrum of neurodivergent traits varies widely, encompassing subtle nuances that often go unnoticed by many to more pronounced divergences that can result in behaviours outside societal norms. These travellers find it harder to adapt to new surroundings making quality sleep at hotels challenging. From sensory challenges to difficulty with social interaction, the neurodivergent traveller may be no stranger to sleep issues and may even have a medical diagnosis for their sleep problems. The change in routine and the unpredictable nature of a night in a new room will be more challenging for them.

Social: A study published in the Journal of Travel Research found that 58% of social travellers report experiencing sleep disruptions while on the road, often due to late-night social activities and varying sleep environments. Their day may be filled with excitement or adrenaline or involve late night activities which push back bedtime and change their normal routine. Although a change to their routine is inevitable, consideration should be taken for the impact on their sleep. These travellers will also need to think about their diet, alcohol and caffeine consumption to ensure these don't impact sleep quality.

Ways to ensure an optimum night's sleep:

citizenM believe sleep should be simple. The most important factors to focus on when you travel are:

- Understanding what schedule works best for your sleep pattern.
- A cool room temperature (approximately 18 degrees or a cool comfortable temperature).
- A dark room, ideally 'blacked out' for sleep.
- Natural light in the room.
- Warm lighting like orange or yellow in the room and avoid blue light close to bedtime.
- A comfy bed and pillows.
- Noise reduction methods or white noise.

- Take time to relax and unwind before sleep.
- Reduce and/or manage caffeine and alcohol when travelling.

citizenM provides their travellers with the opportunity to achieve all the above, thanks to the citizenM in room iPad or free award-winning app which allows you to easily adjust settings to create the perfect sleep environment. Unlike other hotels, where finding a light switch can feel like a treasure hunt, citizenM's use of technology and a centralised control pad mean achieving the best sleep hygiene is simple. By understanding the science of sleep, sleep chronotypes and addressing the unique challenges faced by different types of travellers, this white paper offers actionable insights to help citizenM hotels provide their patrons with the best possible sleep experience. citizenM wishes to give this sleep advice to their guests, so it leaves them feeling educated on the choices they make to optimise their sleep when travelling – and in that, making citizenM the best choice when choosing a hotel.

2 Introduction:

2.1 Introduction to sleep science

The division of sleep science at Harvard Medical School describes ‘Sleep’ as being: *‘patterns of brain waves and other physiological functions. Not the passive state many people once considered it to be, sleep is now known to be a highly active process during which the day’s events are processed and energy is restored.’* (<https://sleep.hms.harvard.edu/>, n.d.)

Sleep cycles are the rhythmic patterns that govern the stages of sleep we experience each night. Each sleep cycle transitions through four stages of non-rapid eye movement sleep (NREM) sleep and REM sleep or dream sleep. *‘In REM. The brain seems to have an aroused pattern, but the body muscles are paralysed. In NREM the deep stages of sleep are dominated by large, slow delta waves.’* (Green, 2012) As we traverse through the stages of sleep, our brains undergo a complex series of processes, consolidating memories, regulating emotions, and facilitating physical recovery. The cyclical nature of sleep ensures that we move through these stages’ multiple times throughout the night, each cycle contributing to the restoration of our bodies and minds.

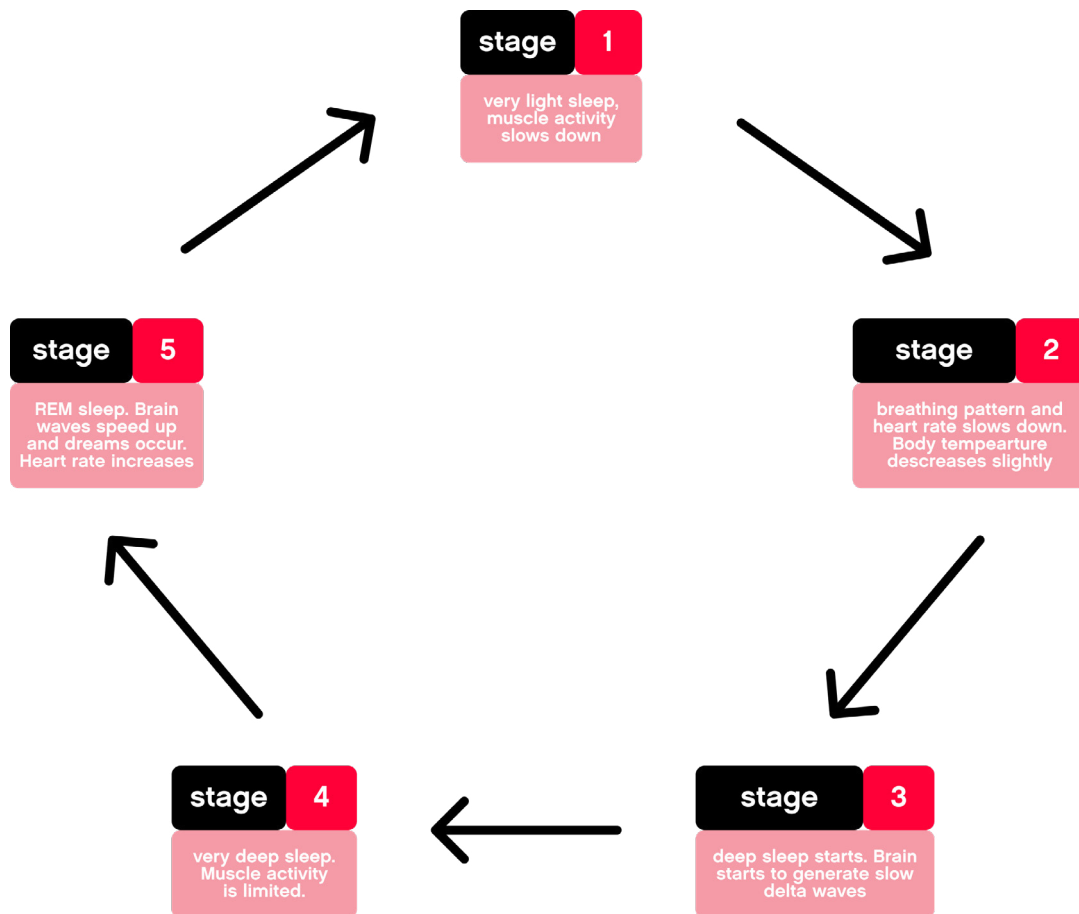


Figure 1 - Sleep stages diagram.

2.2 Why sleep is important

Sleep is a fundamental pillar of human health and well-being, essential for both physical and mental vitality. Beyond just providing a break from the demands of waking life, sleep plays a critical role in various physiological processes, including memory consolidation, immune function, and hormone regulation. It is during sleep that the body repairs and rejuvenates itself, supporting growth and development, while the brain processes information gathered throughout the day, enhancing learning and cognitive abilities. Moreover, a restorative night's sleep is intricately linked to mood stability and emotional resilience, allowing individuals to navigate daily challenges with clarity. In essence, prioritising 'sufficient' and 'quality' sleep is not merely a luxury, but essential for optimal functioning and overall health.

On average, humans require between seven and nine hours of sleep per night. *'More than a third of adults in developed nations failed to obtain the recommended seven to nine hours of nightly sleep. The centres for Disease Control (CDC) stipulates that adults need seven hours of sleep or more per 24 hours. Routinely sleeping less than six hours a night weakens your immune system, substantially increasing your risk of certain forms of cancer. Insufficient sleep appears to be a key lifestyle factor linked to your risk of developing Alzheimer's disease. Inadequate sleep – even moderate reductions for just one week – disrupts blood sugar levels so profoundly that you would be classified as pre-diabetic. 'Short sleeping' increases the likelihood of your coronary arteries becoming blocked and brittle, setting you on a path towards cardiovascular disease, stroke, and congestive heart failure. Sleep disruption further contributes to all major psychiatric conditions, including depression, anxiety, and suicidality.'* (Walker, 2018) This shows the importance of sleep as a key function for all human beings.

The amount of sleep that adults achieve on a nightly basis varies between countries and locations. *'On average Brits are only getting 5.91 hours of sleep a night – this is down from 6.11 in 2022 and 6.19 in 2021. Only 36% said their sleep was "good."* (Index', 2023) These statistics show that on average the amount of sleep obtained has been dropping since the Covid-19 pandemic.

In the United States, this is seemingly different, however recent figures and accurate sources vary dramatically. The 2013 Gallup report suggests: *'Americans usually have around an average of 6.8 hours of sleep each night. This is more than an hour less than the average sleep we got in 1942 of 7.9 hours. 29% of Americans get at least eight hours of sleep, while 14% only get five hours of sleep.'* (CFAH.org, 2024)

2.3 Sleep environment and its impact on a 'good night's sleep'

The sleep environment, encompassing factors such as ambient light, noise levels, temperature, and comfort, plays a crucial role in determining the quality and duration of our sleep. Creating an optimal sleep environment is essential for promoting restorative rest and ensuring overall well-being.

Light, both natural and artificial, influences our circadian rhythm, signalling the body when it's time to wake up or wind down for sleep. *'The suprachiasmatic nucleus or SCN Regulates the activity of the pineal gland, whose major function is to convert the neurotransmitter chemical serotonin into the hormone melatonin (the sleepy hormone). Melatonin is released from the pineal gland into the circulatory system and has actions on many structures in the brain and body. In particular, it seems to influence many rhythmic activities. Release of melatonin from the pineal gland in mammals is ultimately under the control of the SCN. As light fades in the evening, the SCN responds by increasing the secretion of melatonin. Then, as night ends and dawn breaks, the increase in light stimulates the SCN to decrease melatonin secretion.'* (Green, 2012).

A recent report (undertaken by 248 scientists) which looked at light and its impact on circadian rhythm made the following scientific consensus statements:

- *Bright daylight supports circadian rhythm and boosts health: The first set of statements related to the role of bright light and daytime lighting on circadian rhythm. There was strong consensus that robust circadian rhythms are important for health (95.1%) and that disrupting circadian rhythms can cause ill health (98.4%).*
- *Bright lighting at night has negative impact on health: There was strong consensus that increasing indoor light intensity at night increases the disruption of circadian rhythms (90.6%) and increases the suppression of nocturnal melatonin production (94.6%). There was also consensus that repetitive and prolonged exposure to light at night bright enough to cause circadian disruption increases the risk of breast cancer in women (67.6%), obesity and diabetes (74.7%), and sleep disorders (87.4%).*
- *Blue light is a major sleep disruptor: Blue wavelengths, which typically tell the mind its daytime but is now found in artificial lighting, was deemed 'one of the most potent wavelengths for circadian entrainment' (92.7%). There was also consensus that "blue-enriched (460–495 nm) light in the evening (during the three hours before bedtime) disrupts nocturnal sleep more (70.3%), phase delays the circadian system more (75.5%) and disrupts circadian rhythms more (70.1%) than blue-depleted light at the same intensity. There was also strong consensus that exposure to 460–495 nm blue light at night suppresses melatonin production (90.6%) and disrupts circadian rhythms" (84.9%). (Crossley, 2023)*

'Many of us suffer from overexposure to nighttime light, particularly blue dominant LED light from our digital devices. This evening digital light suppresses melatonin and delays our sleep timing. What if we can turn that problem into a solution? Soon, we should be able to engineer LED bulbs with filters that can vary the wavelength of light that they omit, ranging from warm yellow colours less harmful to melatonin, to strong blue light that powerfully suppresses it.' (Walker, 2018)

The ability to control lighting within the hotel room will allow travellers to avoid suppressing

melatonin and create a sleep conducive space through their lighting choices. The pervasive presence of blue light in our modern lives, emitted primarily by screens such as smartphones, tablets, and computers, has emerged as a significant disruptor of our sleep patterns. Blue light, with its short wavelength and high energy, interferes with our body's natural production of melatonin, the hormone responsible for regulating sleep-wake cycles. Exposure to blue light, especially in the evening hours, suppresses melatonin production, tricking our brains into thinking it's still daytime and delaying the onset of sleep. This delay not only shortens the duration of our sleep but also affects its quality, leading to fragmented and restless nights. Efforts to mitigate the impact of blue light on sleep include using blue light filters on screens or wearing glasses that block the blue light, limiting screen time before bed, and adopting healthier sleep hygiene practices to promote better rest and overall well-being. These steps help us to restore balance.

With the right management, blue light can be controlled, and the effects minimised. If the use of a screen such as a smartphone before bed reduces overall stress to an individual, then this could be acceptable. Keeping a control of time and how long the device is used for is more important. Consideration should also be taken for the content being consumed – for example, relaxing by talking with friends is preferable to checking stressful work emails, or emerging negative news stories. This would need to be managed by the individual who would need to show good device discipline.

Similarly, noise disturbances in the sleep environment can disrupt sleep continuity and affect sleep architecture, leading to fragmented rest and diminished sleep quality. *'Loud noise disturbances can cause severe sleep fragmentation and disruption, which in turn can have negative impacts on your physical and mental health. Research even suggests that noise at low levels can cause you to shift to a lighter sleep stage or wake up momentarily. You should strive to keep your bedroom as quiet as possible by blocking outside noises. The whir of a fan or a soothing white noise machine can effectively mask other sounds and help you fall asleep. Some people also enjoy listening to music when they go to bed.'* (Rehman, 2024) Others may use ear plugs to minimise noise during the night. Avoiding disruption is important to ensure that quality sleep is achieved.

Temperature is also a key factor to consider when it comes to the sleep environment. Temperature plays a huge role in helping our bodies get ready for sleep. Moreover, temperature and comfort levels in the sleep environment directly impact our ability to fall asleep and stay asleep throughout the night. *'The temperature of your bedroom can make a significant difference to your sleep quality. The best room temperature for sleep is approximately 65 degrees Fahrenheit (18.3 degrees Celsius). This may vary by a few degrees from person to person, but most doctors recommend keeping the thermostat set between 65 to 68 degrees Fahrenheit (15.6 to 20 degrees Celsius) for the most comfortable sleep.'* (Rosen, 2024) Ensuring the room is at the right temperature level is key to achieving the best sleep possible.

'Your core body temperature generally hovers around 98.6 degrees Fahrenheit (37 degrees Celsius) but fluctuates by about two degrees Fahrenheit throughout the night. The drop in temperature starts about two hours before you go to sleep, coinciding with the release of the sleep hormone melatonin. During sleep, body temperature continues to fall, reaching a low point in the early morning and then gradually warming up as the morning progresses. Lowering the thermostat at night can work in tandem with these natural temperature fluctuations, signalling to the body that bedtime is approaching.' (Rosen, 2024) When our sleep environment is too hot it can make it harder to fall asleep as the heat causes discomfort and restlessness. If the room is too hot, it can in turn interfere with the body's thermoregulation abilities and cause fatigue.

Temperature can also affect sleep quality. *'A higher core body temperature has been associated with a decrease in restorative slow-wave sleep and subjective sleep quality. Similarly, a bigger difference in temperature between the core and the extremities, indicating that the body is not efficiently sending heat away from the core, has been associated with decreased sleep efficiency and a higher likelihood of waking up after falling asleep.'* (Rosen, 2024) Controlling the temperature of the room you sleep in not only helps you to fall asleep, but stay asleep too.

Comfort is the final element to consider when creating a 'good' sleep environment. Having a comfortable mattress and soft pillows will help with comfort and ultimately, quality of your sleep. *'The bedding in your sleep kit needs to be breathable so that you don't experience any unwelcome changes in temperature. We need to be cool under the covers, and if it gets too stuffy and warm under there, it will interfere with your sleep.'* (Littlehales, 2016) Choosing fabrics which help us to stay cool will ultimately help our sleep quality.

Understanding the significance of these environmental factors underscores the importance of cultivating a space conducive to achieving deep, rejuvenating sleep.

2.4 Regularity and sleep – circadian rhythms

Our natural human daily cycles are described as 'circadian rhythms'. *'Our circadian rhythm comes from the Latin circa (around) and dies (day) and is a cycle that roughly corresponds to one day. In humans, circadian rhythm is governed by a small group of brain cells located in the hypothalamus (just above the optic nerve). Another way to think of it is as a master clock set to a schedule of approximately 24 hours – the exact time varying for each of us. Our circadian rhythm cycle, dipping and rising at different times of the day, needs constant input in the form of natural light to be calibrated properly and interacts with the build-up of sleep pressure from being awake to regulate our sleepiness and wakefulness throughout the day.'* (Huffington, 2016). These cycles are unique to everyone, and our associations with external factors also differ from person to person.

Scientists have recently found evidence that sleep regularity is even more important than the amount of sleep we get. *'Emerging research demonstrates that sleep regularity,*

the day-to-day consistency of sleep-wake timing, can be a stronger predictor for some health outcomes than sleep duration. (Windred DP, 2024). Regularity is also extremely individual and corresponds with our sleep chronotype, external factors, and the volume of sleep pressure created by adenosine building up in the brain.

During a recent sleep study, scientists ‘compared the effect of regularity and duration with the risk against all causes and core specific monotonicity. The study calculated Sleep Regularity Index (SRI) scores from >10 million hours of accelerometer data in 60977 UK Biobank participants (62.8 ffl 7.8 years, 55.0% female). Mortality was reported up to 7.8 years after accelerometer recording in 1859 participants (4.84 deaths per 1000 person-years). Higher sleep regularity was associated with a 20%-48% lower risk of all-cause mortality, a 16%-39% lower risk of cancer mortality, and a 22%-57% lower risk of cardiometabolic mortality across the top four SRI quintiles compared to the least regular quintile.’

‘Results were adjusted for age, sex, ethnicity, and sociodemographic, lifestyle, and health factors. Sleep regularity was a stronger predictor of all-cause mortality than sleep duration, by comparing equivalent mortality models, and by comparing nested SRI-mortality models with and without sleep duration’. (Windred DP, 2024)

These amazing results indicate that regularity in sleep is important when it comes to predicting mortality risk. It was noted to be even more important than sleep duration when comparing the data. This means that setting a simple target of ‘getting to bed at the same time every night’ can have a significant benefit to overall health.

2.5 The role of sleep pressure

Sleep pressure, governed by the accumulation of adenosine in the brain, plays a vital role in regulating our sleep-wake cycle and ensuring restorative sleep. Adenosine, a byproduct of cellular metabolism, gradually builds up in the brain throughout the day, reaching its peak by evening. As adenosine levels increase, it binds to receptors in the brain, promoting drowsiness and signalling the body’s need for rest. *‘The longer you are awake, the more adenosine will accumulate. Think of adenosine as a chemical barometer that continuously registers the amount of elapsed time since you woke up this morning. One consequence of increasing adenosine in the brain is an increasing desire to sleep – this is known as sleep pressure and it is the second force that will determine when you feel sleepy, and thus should go to bed.’ (Walker, 2018)* Consequently, the gradual decrease in adenosine levels during sleep alleviates this pressure, allowing for the restoration of cognitive function, memory consolidation, and overall well-being. Understanding the significance of sleep pressure and the role of adenosine underscores the importance of quality sleep in maintaining optimal health and performance.

Most people feel the pressure to fall asleep after around 12 to 16 hours from waking, however this is assuming you have a stable circadian rhythm and have not recently travelled through numerous time zones. Jet lag has an extreme effect on sleep pressure

– you can be awake for far longer and still struggle to fall asleep.

The principal enemy of sleep pressure is caffeine, a widely consumed stimulant found in coffee, tea, and various other beverages and foods, as well as over the counter medicines. Caffeine works by blocking adenosine receptors in the brain. *'By hijacking and occupying these receptors, caffeine blocks the sleepiness signal normally communicated to the brain by adenosine. The upshot: caffeine tricks you into feeling alert and awake, despite the high levels of adenosine that would otherwise seduce you into sleep.'* (Walker, 2018)

Caffeine interferes with the body's natural sleep-wake cycle. As a result, individuals who consume caffeine, particularly later in the day, may have trouble falling asleep or maintaining restful sleep due to the persistence of caffeine. *'The persistence of caffeine in your system can be problematic. In pharmacology, we use the term 'half-life' when discussing a drug's efficacy. This simply refers to the length of time it takes for the body to remove 50% of a drug's concentration. Caffeine has an average half-life of five to seven hours. Let's say you have a cup of coffee after your evening dinner around 7.30 PM. This means that by 1.30 AM 50% of that caffeine may still be active and circulating throughout your brain tissue. Sleep will not come easily or be smooth throughout the night as your brain continues its battle against the opposing force of caffeine. Most people do not realise how long it takes to overcome a single dose of caffeine and therefore, fail to make the link between the bad night of sleep we wake from in the morning and the cup of coffee we had 10 hours earlier with dinner.'* (Walker, 2018)

Understanding the impact of caffeine on sleep pressure highlights the importance of moderating caffeine intake, especially close to bedtime, to promote healthy sleep habits and optimal restorative rest.

Napping: Naps can be a great way to recharge when you're lacking sleep while travelling, but it's crucial to avoid excessive napping, even if you have travelled through several time zones and are feeling the effects of jet lag. Overly long naps can leave you feeling more tired than before. Additionally, napping too late in the afternoon or evening can disrupt your overall sleep pattern, as the release of sleep pressure means falling asleep at bedtime could be more challenging. To reap the benefits of napping without the drawbacks, aim for a short nap and try to avoid napping later in the day. *'In general, the best nap length for adults is about 20 minutes and no longer than 30 minutes. Sleeping for 20 minutes allows the napper to get a bit of light sleep to boost alertness, without entering into deep sleep. Waking up from deep sleep can cause grogginess and actually worsen sleepiness.'* (Dr Abhinav Singh, 2024)

Before taking a nap, the traveller should set an alarm for their desired nap length, ideally around 20 minutes. When the alarm rings, they should resist the urge to hit the snooze button, as continuing to sleep can lead to entering deeper sleep stages. To prevent oversleeping, they might set a second alarm to go off a few minutes after the first one. Once the alarm sounds, they should get up immediately and stretch or take a short walk to help overcome any grogginess.

2.6 Traveller personas considered in this white paper

Business / Corporate – (Travels monthly or more regularly) ‘Productivity meets Rest’

For the business traveller, sleep isn't just rest; it's a productivity tool. Studies show that over 40% of business traveller's report sleep issues which occur during travel and hotel stays, impacting their performance and well-being.

Working parent – Young Parent ‘Executive Guardian on the Go’

Amidst the demands of corporate obligations and the responsibilities of parenthood, the business traveller, balancing professional commitments with the duties of raising a family, embodies the intricate juggling act of modern life. For the Executive Guardian on the Go, adequate sleep is crucial for maintaining peak performance in both professional endeavours and parental responsibilities. Without sufficient sleep, this traveller may experience decreased productivity, heightened stress levels, and compromised health, ultimately impacting their effectiveness in both spheres of life. For this traveller, prioritising sleep is not just about personal well-being but also about optimising performance and maintaining a healthy work-life balance.

Overseas traveller – Business or leisure (change of time zone) ‘Global Voyager’

Embarking on journeys across borders and cultures, the overseas traveller ventures into the realm of exploration, where each destination offers new experiences. Rest is crucial for the Global Voyager as they navigate the complexities of international travel. Crossing multiple time zones can disrupt their circadian rhythms, leading to jet lag and fatigue. Adequate rest allows their bodies to adjust to new time zones, aiding in the mitigation of jet lag symptoms and ensuring they are alert and refreshed to fully immerse themselves in their overseas adventures. If the Global Voyager is travelling for work, rest is crucial to perform at their best in their new location.

Neurodivergent traveller – May struggle with travel anxiety insomnia or other Neurodivergent factors “Diverse Wayfarer”

Neurodivergent travellers may encounter several challenges when staying in a hotel, stemming from sensory sensitivities, social difficulties, and the need for routine and predictability. For instance, the unfamiliar environment of a hotel room, with its different lighting, sounds, and textures, could overwhelm individuals with sensory processing differences, leading to discomfort or distress. Creating the best sleep environment for these travellers is going to help them achieve the best sleep possible.

Social traveller - Sports viewer / tourist / gig tripper – Travelling for specific events and managing their sleep: “Social Vacationer”

Embarking on journeys fuelled by the desire for human connection and cultural immersion, the social traveller embraces every destination as an opportunity for exploration and experiences. When staying in a hotel, social travellers prioritise environments that facilitate social engagement and foster a sense of community. From vibrant common areas designed for mingling to organised activities, these travellers seek accommodations that go beyond mere lodging to serve as hubs of social interaction and cultural exchange. Packing their schedule full of adventures and staying up late to attend events and experience different cultures can lead to a reduction in the

amount of sleep they achieve. Although they don't necessarily need to stick to a routine, the changes to their normal sleep patterns can end up having an impact on the Social Vacationer.

3 Chronotypes

Before delving into the detail of how individual traveller types may be able to achieve a more productive night's sleep, it is more important to understand and identify the travellers chronotype.

Sleep chronotypes refer to an individual's natural inclination towards certain sleep patterns, influencing when they feel most alert and when they prefer to sleep. Your sleep chronotype is genetically preconditioned. Several genes have been identified as playing a role in determining an individual's sleep chronotype. *'A major brain structure that appears to function as a key biological clock is the suprachiasmatic nucleus (SCN)' (Green, 2012) 'Tremendous advances have been made in identifying a series of molecules that comprise a core circadian clock that exists in every cell, rather than being exclusive to the SCN.' (David A. Kalmbach, 2017) 'Each cell maintains its own circadian rhythmicity, and the master clock in the SCN seems to play the role of maintaining synchronisation among these cellular clocks. Primarily based on work in model systems, it is now understood that the molecular circadian clock consists of a negative feedback loop involving the Period (PER1, PER2, and PER3) and Cryptochrome (CRY1 and CRY2) genes. Other genes involved in the molecular generation of circadian rhythms include: Casein Kinase 1δ and 1ε (CK1) and transcription factors Circadian Locomotor Output Cycles Kaput Protein (CLOCK), Brain and Muscle ARNT-like Protein (BMAL1 and BMAL2), and Neuronal Pas Domain Protein (NPAS1 and NPAS2).'* (David A. Kalmbach, 2017)

It's important to note that while these genes can influence sleep chronotype, they interact with environmental factors such as light exposure, social schedules, and lifestyle habits. Therefore, the relationship between genetics and sleep chronotype is complex, and individual differences can result from a combination of genetic and environmental influences.

As discussed in section 2.4 above, the combination of sleep chronotype and circadian rhythm is an important factor to discuss. *'The circadian rhythm plays a fundamental role in regulating biological functions, including sleep-wake preference, body temperature, hormonal secretion, food intake, and cognitive and physical performance. Alterations in circadian rhythm can lead to chronic disease and impaired sleep. The circadian rhythmicity in human beings is represented by a complex phenotype. Indeed, over a 24-hour period, a person's preferred time to be more active or to sleep can be expressed in the concept of morningness-eveningness.'* (Montaruli A, 2021)

Understanding one's chronotype provides valuable insights into optimising productivity, energy levels, and overall well-being. From 'early birds' who thrive in the morning to 'night owls' who come alive in the evening, recognising, and respecting these

differences can lead to better sleep quality and enhanced daytime performance. *'Structuring your day versus night from more of a circadian-aligned standpoint has been shown to lead to better health outcomes and increased longevity'* (Rochfort, 2023). However, *'Our modern lifestyle and artificial nocturnal light delay our bedtime, make us wake up, and lead to a greater intraindividual variability in sleep timing. Depending on the constraints that social time places on us, our sleep timing may be in or out of phase with the internal circadian timing determined by the circadian clock. When a person's social time is out of phase with their circadian time, they may be considered to suffer from circadian disruption or 'social jetlag'.* (Taillard J, 2021) By aligning daily activities with one's unique chronotype, individuals can unlock their full potential and experience a more balanced and fulfilling lifestyle.

Through the production of sleep schedules citizenM hotels will identify their patrons chronotypes and educate them on ways in which they can optimise their daily routine, improve productivity, enhance mood, and promote overall well-being, as well as how to manage those environmental factors that can impact sleep quality to provide their guests with their best possible night's sleep.

The summary below explains the key differences in each chronotype (you may notice that the below only refers to around 85% of the population – this is because Chronotypes fall on a spectrum and some people land in grey areas between the three main categories). There are also individuals who fall under the extreme ends of these chronotypes and are considered extreme early morning types or extreme evening types. There are also individuals with sleep disorders, such as insomnia or sleep apnea, which are not represented by the below figures.

3.1 Chronotype 1 – Morning Types 'Early Birds'

In sleep science, early birds are often referred to as M types and they make up around 15% of the population. *'M-types (morning types) go to bed and wake up early and achieve their peak mental and physical performance in the early part of the day M-types have been suggested to be more conscientious, agreeable, and achievement-oriented.'* (Montaruli A, 2021)

Early Birds, often characterised by their tendency to rise with the dawn and thrive in the morning hours, represent a distinct chronotype in the realm of sleep patterns. These individuals effortlessly synchronise with the natural rhythm of daylight, finding themselves most alert and energised during the early hours of the day. Early birds are renowned for their ability to seize the morning, often accomplishing a significant portion of their daily tasks before others.

A good schedule for an M-type could be:

Awake: 5.00 AM - 6.00 AM

Most productive between: 9.00 AM - 2.00 PM

Bedtime: 9.00 PM - 10.00 PM

M-types tend to fall asleep more quickly than E-types so the wind down routine can start later for this chronotype.

3.2 Chronotype 2 – Somewhere in-between ‘The In-betweeners’

This intermediate sleep chronotype, often referred to as a ‘The Inbetweeners’, exhibits characteristics of both early birds and night owls. Individuals with this chronotype typically find themselves most alert and productive during the late morning and early afternoon hours, experiencing a gradual rise in energy levels as the day progresses. However, unlike traditional early birds, they may not fully awaken at the crack of dawn, nor do they thrive late into the night like night owls. This flexibility in sleep patterns allows people in between to adapt well to various schedules, making them versatile and adaptable individuals. This chronotype makes up about 55% of the population. *‘People with this intermediate chronotype tend to follow the sun. They do well with traditional office hours but also have no problem maintaining a social life in the evenings.’* (Rehman, 2024)

A good schedule for the inbetweenener could be:

Awake: 6.00 AM - 7.00 AM

Most productive between: 10.00 AM - 2.00 PM

Bedtime: 10.00 AM - 11.00 PM

3.3 Chronotype 3 – The Evening type ‘The Night Owl’

Night owls are referred to as E-types and make up 15% of the population. *‘E-types (evening types) get up and retire later and reach their best performance during the second half of the day. E-types have been indicated to be slightly more extroverted, exhibit neurotic traits, and are more disposed to mental or psychiatric, mood, personality disturbances, and eating disorders. E-types were more prone to sleep complaints compared with M-types, with E-types showing difficulties in initiating and maintaining sleep. E-types also reported suffering nightmares and insomnia symptoms more often than M-types. Both the use of self-assessment questionnaires and actigraphy to investigate differences in sleep parameters (e.g., sleep timing) between weekdays and weekends revealed that E-types go to bed and wake up much later than M-types on both work and non-workdays, and that ‘eveningness’ is associated with later bedtimes and wake-up times and shorter times in bed during the week.’* (Montaruli A, 2021) Modern society is not set up for this chronotype and so they are often working against their natural rhythm. *‘It’s the PM’ers that suffer because they are effectively trying to operate in a different time zone to their internal body clock.’* (Littlehales, 2016)

‘A study by Vitale and colleagues (2015) demonstrated that sleep quality and quantity were lower in E-types compared with in M-types on weekdays and that E-types reached the same levels as the other chronotypes on the weekend. These data suggest that E-types accumulate a sleep debt during the week due to social commitments that force them to wake up earlier than their preferred times, and then they recover the debt over the weekend when they sleep better and longer.’ (Montaruli A, 2021) *‘The social time*

of late chronotype individuals during weekdays is not adapted to their circadian time, unlike on free days. This results in 'social jetlag' and circadian disruption, which in turn induces a chronic sleep debt due to a late bedtime and an early wake time, which is compensated on free days but only partially.' (Taillard J, 2021). This sleep debt has a huge impact on E-types and their personality. E-types are often associated with higher levels of extraversion and openness.

A good schedule for an E-type could be:

Awake: 7.30 AM - 9.00 AM

Most productive between: 1.00 PM - 5.00 PM

Bedtime: midnight - 1.00 AM

To help the E-types with their morning routine, introducing light into the bedroom by raising the black-out blind and flooding light into the room allows their body clock to adjust and kick start their day. 'For the night owl, daylight in the morning is vital if you want to set your body clock to play catch up with the early birds.' (Littlehales, 2016) E-types tend to need longer to wind down and fall asleep in the evening too, so this needs to be considered when writing a sleep schedule.

4 Travel Personas & the challenges they face

4.1 Standard sleep challenges all travel personas face:

4.1.1 Unfamiliar environment:

The hotel room is a new and unfamiliar environment, which can make it difficult for individuals to relax and fall asleep. The quality of mattresses and pillows in hotels may not meet the traveller's preferences, leading to discomfort and difficulty in falling asleep. Even the layout of the room being different from home can unsettle people and it can take them longer to settle to sleep.

4.1.2 Noise:

Hotels can be noisy environments, with sounds coming from adjacent rooms, hallways, elevators/lifts, or outside traffic. This ambient noise can disrupt sleep, especially for light sleepers.

4.1.3 Temperature and climate control:

Inconsistent room temperature or inadequate temperature controls can make it uncomfortable to sleep, especially if the room is too hot or too cold. In some cases, the traveller may be used to sleeping in an environment at home which is higher than the recommended 18 degrees, therefore there will be a strong personal preference on what constitutes a comfortable temperature depending on the individual.

4.1.4 Light:

Hotels may have inadequate light-blocking curtains, allowing light from street lamps or early morning sunlight to enter the room, disrupting sleep. Limited lighting options within the hotel room could also mean lighting within the room isn't supporting the best sleep environment for the traveller.

4.2 The Business/Corporate Traveller:

'Fatigue has a massive economic impact, costing employers billions of dollars a year. It is estimated that reductions in productivity and motivation, along with health care costs related to fatigue, cost individual employers around \$1967 annually per employee. When these losses in productivity are added up, fatigue at work costs companies in the U.S. around \$136.4 billion dollars a year.' (Newsom, 2023)

The Sleep charity, a UK based charity also carried out a survey, they found that *'almost 60% of respondents have experienced their attention span being negatively affected by a bad night's sleep more than once. A lack of attention can lead to some really serious problems; agreeing to things you don't want to, making poor choices at work and generally being uninterested and 'zoned out'. 41% also said that they found themselves overwhelmed and less able to cope with work on multiple occasions due to a lack of*

sleep.’ (Charity, 2021)

4.2.1 Work-related stress:

Business travellers may ruminate over work-related stress or anxiety, which can affect their ability to unwind and fall asleep in a hotel room. The pressure to perform well during business meetings or meet deadlines can lead to increased stress and difficulty in winding down for sleep, which can be further impacted by being in an unfamiliar environment. Cortisol is a stress hormone *‘there’s no question that chronically elevated cortisol contributes to sleep disruptions and other health problems. The challenge for many of us is to keep cortisol levels from veering too high’*. (Breus, <https://sleepdoctor.com/>, 2024).

4.2.2 Diet and exercise:

Changes in diet or consuming heavy meals close to bedtime can affect sleep quality. Caffeine or alcohol may also be consumed in higher doses than the individual would consume at home, which will also have an impact on the ability to fall asleep and sleep quality throughout the night. The lack of exercise options available may also mean they miss out on their normal workout routine.

4.2.3 Excessive blue light consumption:

When travelling for business, this persona may be tempted to work long hours completing work tasks or catching up on emails on their laptop for too long into the evening, delaying their bedtime, and disrupting their sleep schedule. The constant notifications and temptation to check emails or scroll through social media on their smartphone can distract a business traveller from going to bed on time and lead to overexposure of blue light.

4.3 The Working Parent – Young Parent:

Working parents face all the same challenges found with a business traveller, however they can face additional challenges when staying in a hotel without their family:

4.3.1 Emotional Separation:

Being away from their family can evoke feelings of loneliness and emotional separation, impacting their ability to relax and sleep peacefully. The absence of family in a hotel setting can exacerbate the struggle to maintain a healthy work-life balance, leading to increased stress and difficulty in unwinding after work. It could also encourage individuals to go out and eat and drink excessively to suppress their feelings.

4.3.2 Parental Responsibilities:

Even when away on business, parents may still feel the weight of parental responsibilities, worrying about their children’s well-being and missing out on important family moments. They may also feel guilt for leaving the responsibilities to their spouse or partner.

4.3.3 Sleep Deprivation:

Sleep deprivation can have significant impacts on a working parent’s physical health, mental well-being and overall productivity at work. They may be starting their stay sleep deprived due to their young family at home, and the disruption that this can bring

to night time sleep.

4.3.4 Difficulty Unwinding:

The absence of familiar routines and family dynamics can make it difficult for working parents to unwind and transition into a restful state, impacting the quality of their sleep during their hotel stay.

4.4 Overseas Traveller – Business or leisure (change of time zone):

The overseas traveller or 'time traveller' moves across time zones. This could be a simple move across states in the US or flying from London to Kuala Lumpur. When your biological clock becomes desynchronised from external zeitgebers the disruption of our biological rhythm and its effects are known as 'jet lag'. This will be the main challenge for our overseas traveller.

4.4.1 Jet lag:

Crossing time zones can disrupt travellers' internal clocks, leading to jet lag and difficulty adjusting to local time, which in turn can affect sleep quality and energy levels during their hotel stay. Overseas travellers will experience various degrees of jet lag. One of the factors affecting the severity of the jet lag is the direction of travel. *'It was shown that American servicemen took on average about three days to recover from the symptoms of jetlag after travelling from Europe to the USA (East to West, phase delay), and on average eight days when travelling from the USA to Europe (West to East, phase advance). Phase advance is more difficult for the body to adjust to than phase delay.'* (Green, 2012) The direction of travel will have an impact on recovery and adjustment for the traveller. This is simply because *'travelling in an eastward direction requires that you fall asleep earlier than you would normally, which is a tall biological order for the mind to simply will into action. In contrast, the westward direction requires you to stay up later, which is a consciously and pragmatically easier prospect. Our natural circadian rhythm is innately longer than one day – about twenty-four hours and fifteen minutes. Modest as this may be, this makes it somewhat easier for you to artificially stretch a day than shrink it.'* (Walker, 2018)

Another factor affecting travel may be the number of time zones travelled and a larger adjustment of the internal body clock of those experiencing long haul flights. When we travel through several time zones, we experience a desynchronisation of the biological clock and depending on the adjustment may take days to adjust. Individual differences in biological rhythms can make certain people more sensitive to jet lag than others.

4.4.2 Missing home:

Overseas travellers may miss their loved ones and their native environment. Overseas travellers can experience homesickness, longing for the familiar comforts of home, such as family, friends, and familiar surroundings during their hotel stay in a foreign country. There can be significant variations between cultural patterns of behaviour and even local customs and laws.

4.5 Neurodivergent traveller:

Neurodivergence refers to individuals whose brain functions diverge from what is perceived as standard or typical. The spectrum of neurodivergent traits varies widely, encompassing subtle nuances that often go unnoticed by many to more pronounced divergences that can result in behaviours outside societal norms. These travellers find it harder to adapt to new surroundings, making quality sleep at hotels challenging. Many neurodivergent people also struggle with their sleep and experience a wide range of sleep disorders. *'An estimated 50-75% of adults with ADHD experience sleeping problems, ranging from insomnia to secondary sleep conditions. If you have ADHD, you are more likely than others to sleep for shorter periods overall, have problems initiating sleep and remaining asleep, and you may even develop sleep disorders.'* (Healthcare)

4.5.1 Sensory overload:

Hotels can be overwhelming due to bright lights, loud noises, crowded spaces, and unfamiliar smells, which can trigger sensory sensitivities for neurodivergent individuals. Two examples of neurodivergent individuals are those with autism spectrum disorder (ASD) or sensory processing disorder (SPD). Neurodiverse travellers may also have an increased sensitivity to blue light from smartphones, laptops, and other screens which can also disrupt their melatonin production.

4.5.2 Unpredictability and routine disruption:

Changes in routine or unfamiliar environments can be distressing for neurodivergent individuals who thrive on predictability and structure. Hotel stays disrupt familiar routines, leading to increased anxiety or discomfort. This may also mean they have trouble settling, winding down and going to sleep.

4.5.3 Social interaction challenges:

Interacting with hotel staff, other guests or navigating social situations within the hotel can be overwhelming for neurodivergent individuals. Some struggle with social cues, non-verbal communication, or social anxiety.

4.5.4 Lack of suitable accommodation:

Hotels may not always provide accommodation or resources tailored to the needs of neurodivergent guests such as sensory rooms, visual schedules, or quiet spaces for relaxation.

4.5.5 Common Sleep problems for neurodivergent individuals:

Experiencing sleep problems is very common in neurodivergent travellers and there are several reasons for this, ranging from genetic differences to sensory issues, as well as the side effects of medications and trouble recognising and responding to bedtime cues. *'Sleep problems can be divided into two main groups: problems with sleeping (called 'dyssomnias') and problems around sleep (called 'parasomnias'). The common problems with sleeping are getting to sleep, staying asleep or being sleepier during the day than normal. These are problems like delays settling into sleep, frequent night or early morning waking, and excessive daytime sleepiness. Most people with ASD who have sleep problems have difficulties in one or more of these areas.'* (Aitken, 2014)

Neurodiverse individuals can be particularly prone to insomnia, which can be intensified if there are levels of increased anxiety or the individual is struggling to relax. *'Insomnia*

is the term used for a persistent difficulty in getting to sleep or staying asleep. Adults with insomnia are more likely to be anxious, depressed, and suffer from persecutory ideation. Insomnia is the most common sleep concern reported in ASD. It is also a frequent problem in Asperger syndrome.' (Aitken, 2014).

Neuro divergent travellers may also suffer from sleep problems like restless leg syndrome, nocturnal seizures, sleep related rhythmic movement disorder, sleep apnea, short nighttime sleep and circadian rhythm disorders. *'Irregular secretion of the sleep hormone melatonin, which regulates sleep patterns or having atypical circadian rhythms (body clock). Waking repeatedly during the night or having difficulty getting back to sleep after waking up to go to the toilet.'* (<https://www.autism.org.uk/>, 2020) are all reported by those who are neurodivergent. Giving this traveller type the best conditions for sleep and allowing them a calm space to wind down is the foundation for their best night's sleep.

4.6 The Working Parent – Young Parent:

A study published in the Journal of Travel Research found that 58% of social travellers report experiencing sleep disruptions while on the road, often due to late-night social activities and varying sleep environments. Despite these challenges, social travellers frequently value the social benefits of these experiences over the quality of their sleep.

4.6.1 Excitement and adrenaline:

The excitement and adrenaline from attending a concert or sporting event can make it hard to wind down and fall asleep. The heightened energy and anticipation can keep the mind active for hours before and after an event.

4.6.2 Late-night activities:

Concerts and sporting events often end late, leading to a late return to the hotel. Post-event activities, such as socialising or grabbing a late meal, can push bedtime even later, making it difficult to settle down for the night and achieve the full quota of sleep.

4.6.3 Changes in routine:

Travelling and attending events disrupt regular routines, including sleep schedules. This change can make it harder to fall asleep and stay asleep. The social traveller may also be tempted to take a nap during the day and whilst this may help them stay awake longer into the evening, this can make it harder to fall asleep at night. The timing and the length of the nap should be considered as described in section 2.5.

4.6.4 Alcohol and caffeine:

Consumption of alcohol or caffeinated beverages during the event can interfere with sleep pressure and sleep patterns, causing difficulty in falling or staying asleep.

5 Recommendations & conclusions

5.1 General recommendations for all traveller types

5.1.1 Unfamiliar environment:

When staying in an unfamiliar environment you need to get comfortable and cosy. citizenM hotels state: *'We stripped away all unnecessary and unwanted extras to give our guests everything they truly need. Our room philosophy is to provide everything a guest needs, and nothing they don't.'* This means the rooms have a high functionality without being fussy or over-decorated. *'The beds are enormous, extra-large king-size with ultra comfortable mattresses, luxury duvets and soft pillows'*. Each bed is topped with 'the finest European linens' for a comfortable sleep space. From the welcome message on the citizenM in room iPad to the multiple options to change the look and feel of the room, each traveller can personalise their space during their stay.



Figure 2 - citizenM Room layout.

5.1.2 Noise:

Noise reduction is key in hotels. citizenM hotels have also considered the impact of noise on their guests, citizenM states *'citizenM buildings are contemporary combinations of clean lines, toughened steel, and soundproof glazing in identifiably square units. Typically, the prebuilt modules consist of two bedrooms framed in steel, connected by a hallway. A key advantage of this over a traditionally built hotel, where rooms share walls, ceilings, and floors, is that each room module is acoustically separated with its own steel frame, significantly enhancing guest experience through*

improved soundproofing and acoustical controls. Steps to manage noise mean guests will not be disturbed unnecessarily from noises within the hotel or noise from outside.

In the future, it would be ideal if the citizenM in room iPad had a white noise option or guests were offered ear plugs at reception. These steps allow the optimum environment when it comes to noise prevention.

5.1.3 Temperature and climate control:

As we discovered in section 2.3 above, our bodies need to drop their core temperature to induce sleep and so keeping the room cool can help a traveller fall asleep more easily. The ideal temperature for the optimum sleep environment is 65 degrees Fahrenheit (18.3 degrees Celsius). This is the suggested temperature for **every** sleep schedule. *Thermal environment, specifically the proximal temperature around your body and brain, is perhaps the most underappreciated factor determining the ease with which you will fall asleep tonight, and the quality of sleep you will obtain.* (Walker, 2018) This is easily controlled on the citizenM in room iPad, as shown below.



Figure 3 - Temperature control via in room iPad.

Of course, each traveller may have an individual temperature preference. There will be a statement about this within the sleep schedule advice.

5.1.3 Light:

As we discovered in section 2.3 above, light can have a huge impact on our sleep. citizenM has ensured the citizenM in room iPad and app allow guests to dim or change the colour of the room lights. In section 2.3, we learnt how amber or yellow lights are best when getting ready for sleep as they are less likely to suppress melatonin production. Ensuring the intensity of the light is managed is key when winding down for bed. Avoiding bright lights and opting for a more subtle glow will help the traveller to create the best sleep environment. All the above can be easily achieved using the citizenM in room iPad in the room or via the app.



Figure 4 - Lighting controls via in room iPad.

Lastly, travellers should manage blue light consumption before bedtime. There are several ways that they can do this.

1. Turn off blue light devices an hour before bed.
2. Turn off the blue light emitting from the devices to allow them to be used for longer periods of time. (Consideration should be made for the brightness of the screen, even with the blue light turned off).
3. Use blue light blocking glasses whilst using devices. Blue light-blocking filter technology works by either reflecting or absorbing blue light. Lenses with a blue light-reflecting coating can appear bluish, whereas blue light-absorbing lenses feature a yellow or amber embedded tint. These glasses help to manage the blue light entering your eyes, which in turn suppresses melatonin.

citizenM has an excellent set up for helping guests create a dark room when they want to sleep. This can be achieved by the use of the curtain and the black-out blind together, controlled via the app or citizenM in room iPad. Darkness is key in creating a space conducive to sleep.

Conversely, the blackout blind can be raised and the curtain left drawn, which can help if the traveller is struggling to get up in the morning. The light cues provide signals to our internal clock that it's time to get up, whilst the translucent curtain allows the traveller to retain their privacy.

5.2 Conclusion 1 – Business / Corporate Traveller

5.2.1 Work related stress:

It is important for the business traveller to unwind after work and allow themselves time to destress. *'Chronic stress is a major contributor to elevated cortisol, an excessively active hypothalamic-pituitary-adrenal (HPA) axis, and an ongoing state of arousal that's exhausting, anxiety-producing and sleep-depriving.'* (Breus, <https://sleepdoctor.com/>, 2024) citizenM provides options on the citizenM in room iPad such as the 'Dream' mood

to help guests relax and destress before bed.

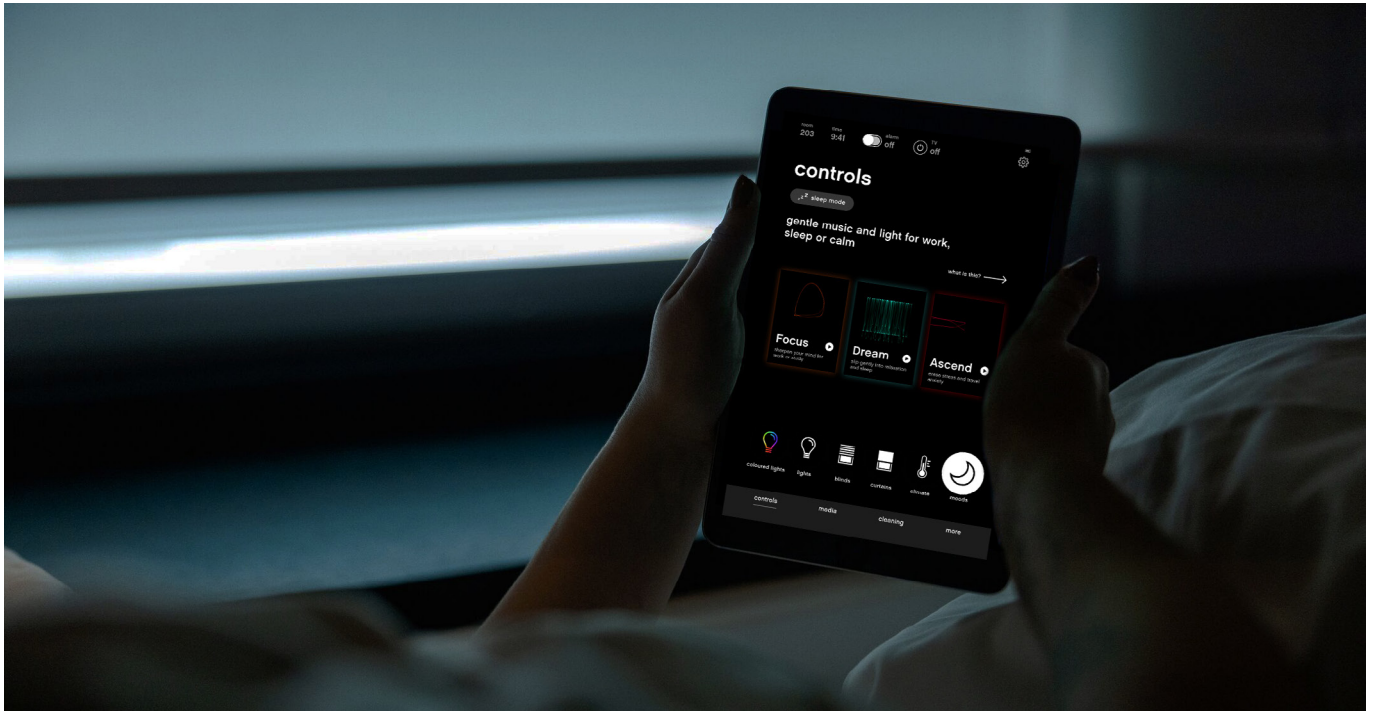


Figure 5 - Mood options via the in room iPad in room iPad.

Taking part in some meditation could also help with stress. *‘Meditation techniques focus the attention and help people have calm reactions to stressful thoughts and situations. Although there are many different types of meditation, most involve focusing, breathing steadily, and maintaining a particular posture in a quiet space. Studies show that certain practices, including mindfulness meditation, may promote better sleep.’* (Breus, <https://sleepdoctor.com/>, 2024)

5.2.2 Diet and exercise:

As stated in section 2.5 above, caffeine needs to be managed to ensure it doesn't disrupt sleep. Caffeine should not be consumed after 2.00 PM or at least six hours before bedtime to ensure sleep isn't affected.

Alcohol consumption should also be monitored to gain the best night's sleep. *‘Many individuals believe alcohol helps them to fall asleep more easily or even offers sounder sleep throughout the night. Both are resolutely untrue. Alcohol is in a class of drugs called sedatives. It binds to receptors within the brain that prevent neurons from firing their electrical pulses. Alcohol sedates you out of wakefulness, but it does not induce natural sleep. The electrical brain wave state you enter via alcohol is not that of natural sleep, rather it is akin to a light form of anaesthesia.’* (Walker, 2018) Drinking alcohol can *‘take your liver and kidneys many hours to degrade and excrete the alcohol, even if you are an individual with fast-acting enzymes for ethanol decomposition. Nightly alcohol will disrupt your sleep.’* (Walker, 2018)

When it comes to the food we eat, scientific evidence suggests that you should avoid going to bed too full or too hungry, and shy away from diets that are excessively biassed towards carbohydrates, especially sugar. However, *‘larger scale epidemiological*

studies have not shown consistent associations between eating specific food groups and sleep quality or quantity.' (Walker, 2018) Sticking to healthy food choices and managing portion sizes before bed is key.

Ensuring travellers stay hydrated is also important. citizenM provides all travellers with cool, filtered water 24 hours a day. This is free and can be collected from canteenM in the living room.

Exercise is another factor that can help to improve the quality of your sleep. *'Studies show that people who exercise at least a couple of times a week are less likely to suffer from sleep disorders.'* (Harrold, 2008) Consideration should be taken about the kind of exercise undertaken. *'Avoid vigorous exercise too near to bedtime, as this will have a stimulating effect that is obviously detrimental to getting to sleep. If you do participate in strenuous exercise, make sure it is at least three hours before your bedtime. You should ideally practise more strenuous exercise earlier in the day. Later in the day, do a more gentle form of exercise, like yoga, which helps you to wind down.'* (Harrold, 2008) citizenM provides their guests with various forms of exercise available on the citizenM in room iPad in their room, including yoga.

5.2.3 Excessive blue light and electronic devices:

As discussed in section 2.3, excessive blue light has a huge impact on melatonin production and should be managed by travellers on the lead up to bedtime. See section 5.1.4 above. Managing the use of devices is also key. Using a phone to connect to friends or family would be preferable to continuing to work and check emails late into the night. Similarly, engaging with content that is emotionally intense, such as thrilling movies, suspenseful books, or stressful news reports, can heighten arousal and make it harder to relax and fall asleep.

Many people find watching a film or television relaxing before bed and the option to cast your devices onto the TV in the room at citizenM means the traveller will have access to their favourite films and shows during their stay. This ability to stream their own content will make the traveller feel a connection to home, which may help them to unwind. The key here is that the traveller should consider what they consume on their devices leading up to bedtime and what time they switch off these devices before bed.

5.3 Conclusion 2 – Working Parent – Young Parent

5.3.1 Emotional separation:

Parents away from home can struggle with the emotional separation from their families. The working parents can stay in touch with video calls, messages, and photo sharing to help maintain a strong emotional bond. Scheduling regular times for virtual check-ins can be comforting for both the parent and the children when they are far from home. The superfast free Wi-Fi available at citizenM means a digital connection to home is always possible.

5.3.2 Parental responsibilities:

As above, staying connected with family whilst away is important, however prioritising self-care is essential for managing stress. Techniques such as meditation, deep

breathing exercises, and mindfulness can help maintain mental well-being. citizenM has developed the citizenM in room iPad to give guests access to gentle exercise, as well as 'moods', combining calming music and relaxing lighting. Access to some breathing techniques or mindful meditation could be an excellent extension to the options on the citizenM in room iPad.

5.3.3 Sleep deprivation:

Travellers with young families may be sleep deprived for a variety of reasons, including young babies or infants needing frequent care throughout the night leading to interrupted sleep. Even as children grow, parents may still need to attend to their needs during the night due to illness, nightmares, or other issues. Parents will often prioritise their children's needs above their own rest, which can impact their time for sufficient sleep. Whilst away from home working parents can take the opportunity to maximise their sleep and achieve the recommended seven to nine hours a night. Following the general advice above and creating the optimum sleep environment will support the best sleep possible.

5.3.4 Difficulty unwinding:

Working parents may find it hard to wind down. Work/life balance is hard to get right, so taking this time away from family to prioritise their own needs is essential. Knowing that their children are being taken care of by their support network of friends and family should help to stem worries. citizenM has multiple facilities on the citizenM in room iPad to help guests wind down. Eating healthily, engaging in light exercise, or activities that bring joy can help with relaxation and allow the working parent to get adequate sleep. The young parent should avoid the temptation to 'cut loose' whilst away from family, as over consumption of alcohol or excessive food before bed can have a negative impact on their sleep.

5.4 Conclusion 3 – Overseas Traveller – Business or Leisure

5.4.1 Jet lag busting tips:

Helping the overseas traveller adjust to local time is going to help them to enjoy their trip to the fullest. *'A great deal of research has investigated coping strategies for jet lag using what we know of biological clocks and exogenous zeitgebers. Light is a key zeitgeber that helps to synchronise biological clocks with the outside world.'* (Green, 2012) To help travellers adjust, it is important that they adapt to local time as soon as possible. *'Probably the most reliable method for reducing the symptoms of jet lag is to adapt immediately to local zeitgebers, such as time of day and mealtimes. This may require use of mild stimulants such as caffeine to stay awake when the biological clock is trying to impose sleep and going out into sunlight early in the morning. As we have seen, light is the key zeitgeber in the synchronisation of circadian rhythms. Exposure to bright light can shift circadian rhythms if used at appropriate points in the circadian cycle; again, this has to be calculated carefully to ensure that rhythms are shifted in the right direction.'* (Green, 2012). The ability to make the room extremely dark using the curtain and the blackout blinds simultaneously means those who need to catch up on some sleep to adjust to local time will be able to achieve the best sleep environment to do so. Similarly, the ability to flood the room with light from the wall-to-wall windows will help to resynchronise their biological clock.

common.’ (Aitken, 2014) citizenM could provide ear plugs for their neurodivergent guests or create the ability to use white noise within the citizenM in room iPad. The fact that the citizenM rooms aren’t ‘fussy’ will help this traveller type. citizenM states: *‘We stripped away all unnecessary and unwanted extras to give our guests everything they truly need and nothing they don’t’*. There is also a curtain that can be drawn between the bedroom side of the room and the bathroom side. This allows the neurodivergent traveller to minimise objects within their sleep space, keeping it clear and functional without being distracting or overstimulating.

5.5.2 Unpredictability and routine disruption:

If the neurodivergent traveller has a solid bedtime routine, then replicating this should be encouraged whilst they are away – including the time they go to bed, if possible. If they follow the same steps before bed every night, they should follow this routine whilst away too. Winding down may also take longer for this traveller type – 40 minutes or longer – so this should be considered within the sleep schedules. Restricting blue light and stimulating activities during this time will also help with sleep onset. Calming activities undertaken in low level lighting will help them to unwind.

5.5.3 Social interaction challenges:

Neurodivergent travellers may be less aware of others and what they are doing. *‘They can be less able to recognise and respond to bedtime cues and respond best to a clear night-time routine.’* (Aitken, 2014). Neurodivergent travellers may find visual cues in the sleep schedules to be extremely useful.

Here, *‘ambassadors’* can help support these travellers by helping them to feel at home with their *‘approachable, down-to-earth and world-wise personality.’* The smooth arrivals and departures also assist these travellers to check in easily with the ability to *‘go straight to their room, then on leaving day complete their check-out in the elevator and walk straight out’*, avoiding staying in an environment they may find overstimulating.

5.5.4 Lack of suitable accommodation:

citizenM hotels are very well set out for their neurodivergent guests. Everything from the simple check-in and check-out processes to the simple layout of the room offering them everything they need without the fuss.

Even the addition of the white curtain in the room, allowing the guest to divide the room into a sleep space and a living space, will help these guests who find a new environment hard to cope with.

5.5.5 Common sleep problems:

Neurodivergent travellers are more likely to suffer from sleep problems than other people. These sleep problems are nothing new to this traveller, who may have struggled with sleep challenges for years. However, research shows *‘various psychological treatments can help. Stimulus control, relaxation training, sleep restriction, cognitive-behavioural therapy (both with and without relaxation) and paradoxical intention have all been shown to work’*. (Aitken, 2014) As you can see from the above, sleep hygiene is key to getting this traveller the best sleep. Use of all the sleep environment advice in **5.1** above and investment in time to unwind and adjust to the room will help this traveller.

They must also avoid napping in the day as discussed in section 2.5, as this may relieve too much sleep pressure and make falling asleep even more challenging.

5.6 Conclusion 5 – Social Traveller – Sports Viewer / Tourist / Gig Tripper

5.6.1 Excitement and adrenaline:

For this traveller, taking time to wind down before bed may take longer due to the excitement and adrenaline of the day's activities. Although it may take longer to fall asleep, the social traveller can take advantage of the ability to plan their own time the following day, ensuring that the right amount to sleep is still available to them. They can sleep longer into the morning if needed, as they may not have the option to stick to their normal sleep routine. However, regularity and sleep are important. Waking up at the same time has huge benefits – *'in fact, setting a constant wake time is one of the most powerful tools at our disposal when looking to improve the quality of our recovery. Our bodies love it, with our circadian rhythms, set by the rise and fall of the sun, working around a consistent point, and our minds love it, because through this constant wake time we can build the confidence to be more flexible in other aspects of our lives'*. (Littlehales, 2016) If their normal routine is disrupted during their stay, then their normal routine should be established as soon as they get home.

5.6.2 Late-night activities:

Concerts and sporting events often end late, leading to a late return to the hotel. Post-event activities such as socialising or grabbing a late meal can push bedtime even later, making it difficult to settle down for the night. As above, this traveller may need time to wind down but following the sleep hygiene advice in section 5.1 will give them the optimum environment to achieve their best night's sleep.

5.6.3 Changes in routine:

Changes in routine can significantly impact sleep patterns. When individuals deviate from their regular schedule, such as altering bedtime or wake-up times, it can disrupt the body's internal clock. Travelling and attending events disrupt regular routines, including sleep schedules.

The social traveller may also be tempted to take a nap during the day. Whilst this may help them stay awake longer into the evening, this can in turn take off some of the sleep pressure that has built up and make it harder to fall asleep in the evening. The timing and the length of the nap should be considered, as explained in section 2.5 above.

5.6.4 Alcohol and caffeine:

Consumption of alcohol or caffeinated beverages during the day's events can interfere with sleep patterns, causing difficulty in falling or staying asleep. They should also consider the advice shared in section 4.2.2 when thinking about the timing and volume of consumption.

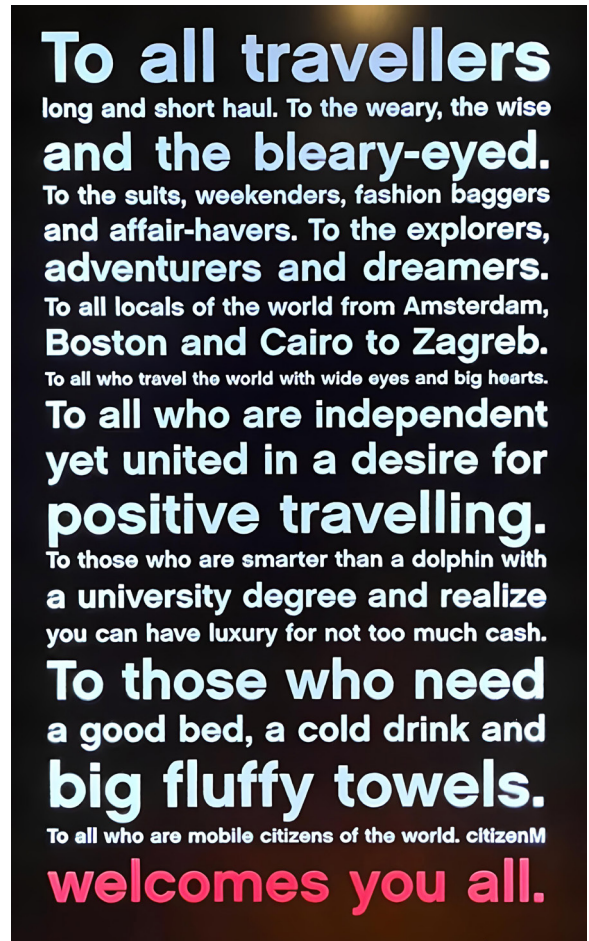
5.6 Conclusion 5 – Social Traveller – Sports Viewer / Tourist / Gig Tripper

The overarching factor is that sleep should be simple. The most important factors to focus on when you travel are:

- Understanding what schedule works best for your chronotype.
- A cool room temperature (approx. 18 degrees or a cool comfortable temperature).
- A dark room, ideally 'blacked out' for sleep.
- Natural light in the room upon waking.
- Warm lighting like orange or yellow in the room and no blue light before bedtime.
- A comfy bed and pillows.
- Noise reduction methods or white noise.
- Take time to relax and unwind before sleep.
- Reduce and/or manage caffeine and alcohol when travelling.

citizenM provides travellers with the opportunity to achieve all of the above and when coupled with the addition of sleep schedules, guests will have all of the requisite information to get the optimal sleep – making it easy to choose citizenM as their go-to hotel when travelling.

citizenM says...



To all travellers
long and short haul. To the weary, the wise
and the bleary-eyed.
To the suits, weekenders, fashion baggers
and affair-havers. To the explorers,
adventurers and dreamers.
To all locals of the world from Amsterdam,
Boston and Cairo to Zagreb.
To all who travel the world with wide eyes and big hearts.
To all who are independent
yet united in a desire for
positive travelling.
To those who are smarter than a dolphin with
a university degree and realize
you can have luxury for not too much cash.
To those who need
a good bed, a cold drink and
big fluffy towels.
To all who are mobile citizens of the world. citizenM
welcomes you all.

6 Assumptions, constraints and opportunities.

6.1 White paper assumptions

This white paper assumes that the majority of travellers considered in the analysis do not have underlying health conditions or pre-diagnosed sleep disorders. The sleep experiences and recommendations discussed are based on the premise of generally healthy individuals, without specific sleep-related medical issues. This allows the findings to be broadly applicable to the average hotel guest seeking to improve their sleep quality while travelling.

6.2 White paper constraints

This white paper does not account for extreme chronotypes, like 'extreme morning types' or 'extreme evening types'. These extreme versions of the early and late chronotypes only account for a small percentage of the population. The creation of sleep schedules for these extreme chronotypes could be added at a later stage but would require further in-depth research.

This white paper does not cover variations in sleep caused by age. We go through various changes in sleep across our life span – for example, during adolescence. *'Adolescent teenagers have a different circadian rhythm from their young siblings. During puberty, the timing of the suprachiasmatic nucleus is shifted progressively forward: a change that is common across all adolescents, irrespective of culture or geography. So far forward, in fact, it passes even the timing of their adult parents. By the time we reach the age of 16, our circadian rhythm has undergone a dramatic shift forward in its cycling phase. The rising tide of melatonin, and the instruction of darkness and sleep, is many hours away. As a consequence, the 16-year-old will usually have no interest in sleeping at 9.00 PM. Instead, peak wakefulness is usually still in play at that hour. By the time the parents are getting tired, as their circadian rhythms take a downturn and melatonin release instructs sleep – perhaps around 10.00 PM or 11.00 PM, their teenager can still be wide awake. A few more hours must pass before the circadian rhythm of their teenage brain begins to shut down alertness and allow for easy, sound sleep to begin.'* (Walker, 2018) Eventually, these rhythms will align with their parents as they transition into young adults.

The next major shift is during middle-old age, which brings another change in circadian timing. *'In sharp contrast to adolescence, seniors commonly experience a regression in sleep timing, leading to earlier and earlier bedtimes. The cause is an earlier evening release and peak of melatonin as we get older, instructing an earlier start time for sleep.'* (Walker, 2018) Quality sleep is harder to achieve in older adults as they can be affected by sleep fragmentation by needing to get up in the night to use the toilet, for example, or the effects of medication on their sleep. Further research could be conducted on age and its impact on sleep for a new sleep schedule to be created, but again, further research would be required.

This white paper is based on scientific research from academic/data driven information

and does not contain any reference to specific hotel traveller research.

6.3 White paper opportunities

Research on Alternative Traveller Groups:

Additional studies could focus on specific traveller groups such as, elderly travellers, or those with disabilities. By examining these groups separately, the research can identify unique sleep challenges and needs, thereby providing more targeted solutions and support for these populations, who might face different or more significant sleep disturbances compared to the general population.

Research on Traveller Type and Age Demographics:

Further research could delve into the interplay between different traveller types (e.g., leisure travellers, business travellers) and various age demographics (e.g., millennials, Generation X, Generation Z). Understanding how age and traveller type influence sleep needs and patterns can help hotels customise their sleep environments and services to cater more effectively to these diverse groups.

Impact of Health and Fitness on Sleep Quality:

Exploring the relationship between travellers' health and fitness levels and their sleep quality could provide valuable insights. Research could investigate how access to gym facilities, exercise routines, and wellness programs at hotels impact the sleep of different traveller types. This could reveal the extent to which fitness amenities contribute to better sleep and help in designing comprehensive health and fitness packages that enhance overall guest well-being.

Using Semi-Structured Interviews for In-Depth Insights:

Implementing a semi-structured interview technique with existing customers or those who have previously stayed at the hotel can yield detailed, personal insights into their sleep experiences. These interviews can capture nuanced feedback on specific aspects of the hotel's sleep environment, such as mattress comfort, noise levels, and room temperature. The qualitative data obtained can provide a deeper understanding of guest preferences and pain points, guiding more effective improvements in sleep-related offerings.

6.4 Next steps – Sleep Guides – a combination of Chronotype and Traveller types

A combination of bespoke sleep guides will be created by combining the traveller's chronotype with the traveller type itself. This combination will allow the traveller to create the best possible personalised sleep schedule for them as individuals. The diagram below shows the relationships between chronotype and traveller types.

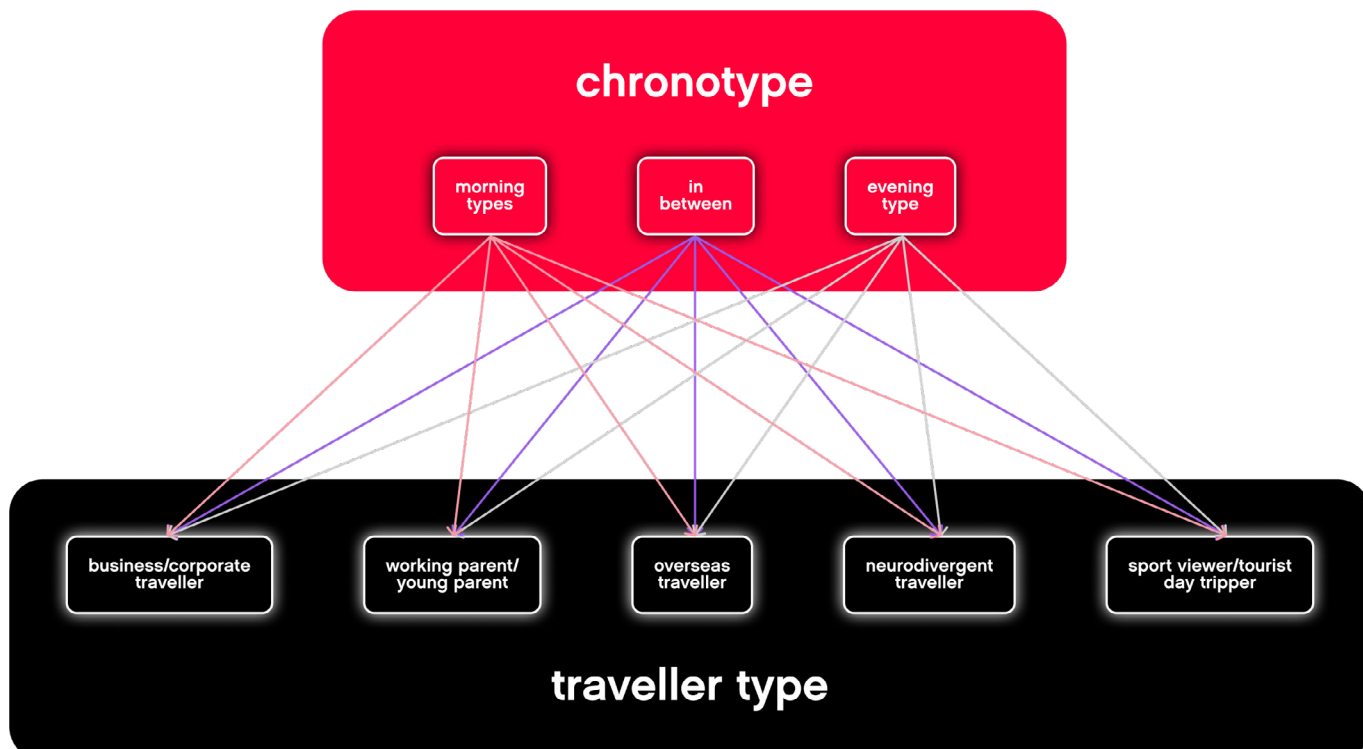


Figure 7 - Sleep schedules explainer diagram.

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