



# DATA DRIVEN MANAGEMENT

## 2024

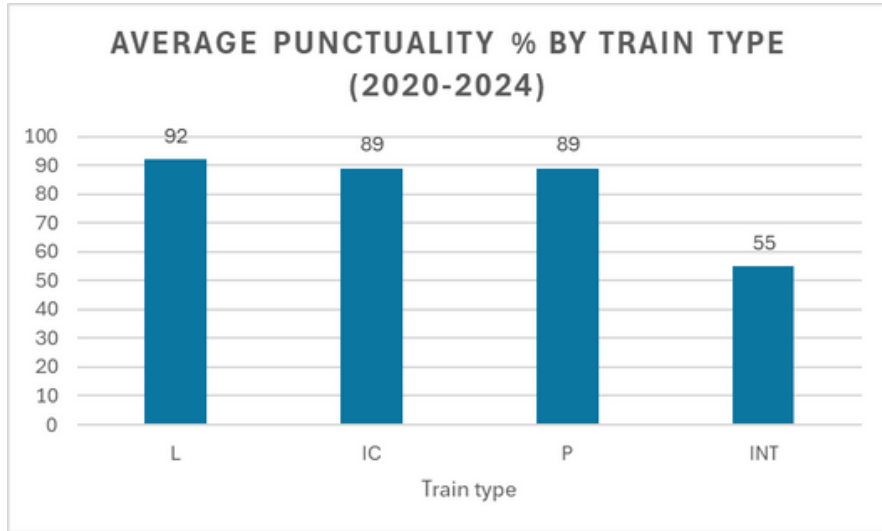
Joshua Craig  
Mirthe Leys  
Rainey Quinn

## Introduction

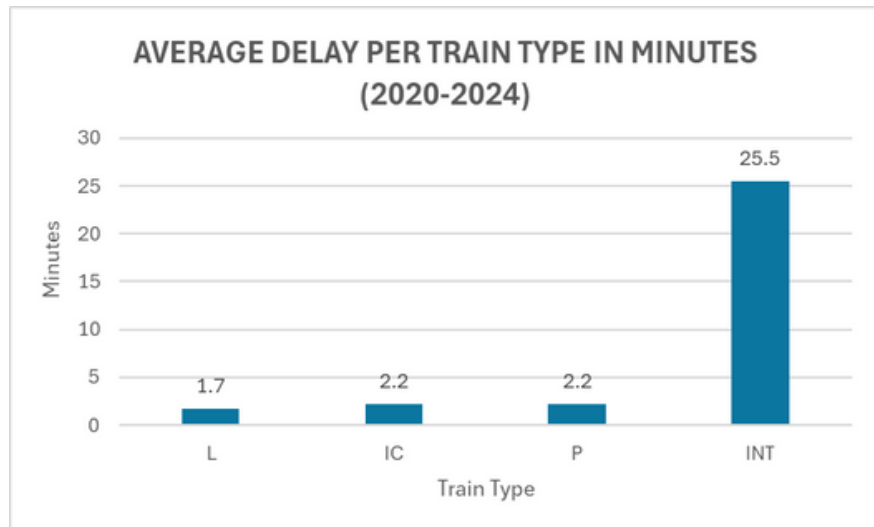
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The punctuality and efficiency of train services are critical for maintaining a reliable public transportation system. This report analyzes data collected from train Infrabel datasets between 2020 and 2024, focusing on performance by train type, season, and specific routes. By evaluating these trends, the analysis aims to identify actionable recommendations to enhance the operational performance of the railway system, ensuring a better experience for passengers and greater reliability in train services.

# Punctuality by Train Type

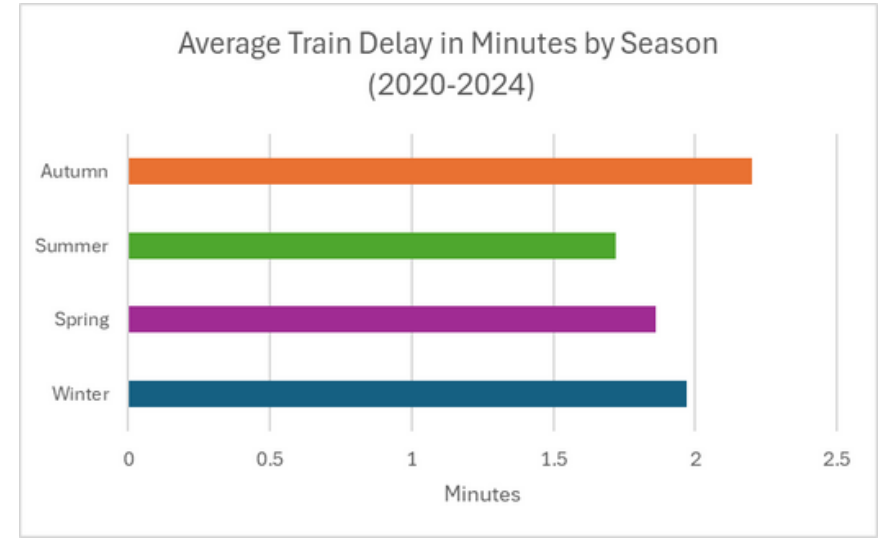


Highlights performance differences among train types (2020-2024), emphasizing where operational improvements are needed.



Shows the severity of delays by train type, underlining the urgency for intervention, especially for INT trains.

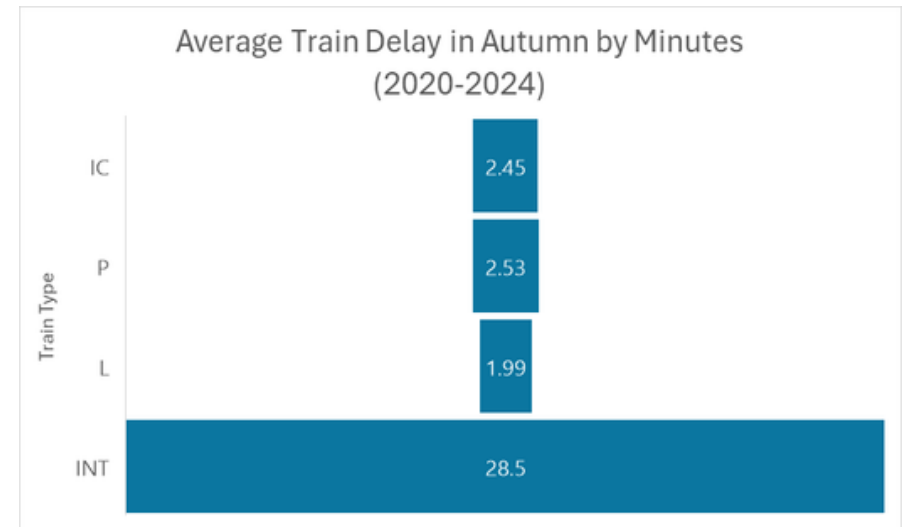
# Punctuality by Season



This graph links seasonal factors to delays (2020-2024), helping planning for punctuality improvements during high-impact periods.

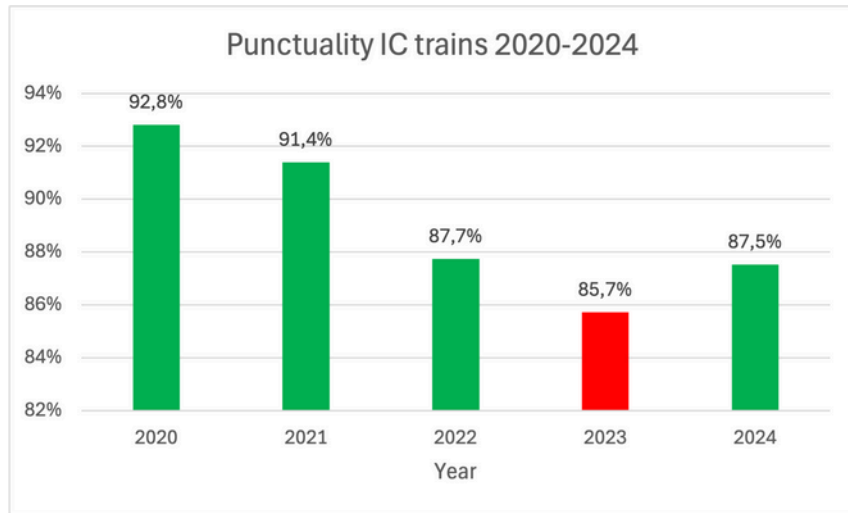
The four graphs showing punctuality by train type and season provide an overview of train delay patterns across different seasons and train categories from 2020 to 2024. The data reveals that the INT train has consistent issues with punctuality and longer delays compared to other types.

Seasonal trends indicate that Autumn generally experiences longer delays than other seasons. While various factors may contribute to this, it suggests that additional planning and preparation during the Autumn months could help reduce delays.



Focuses on autumn delays, emphasizing the critical need to address INT train inefficiencies during this season, with P train the next focus.

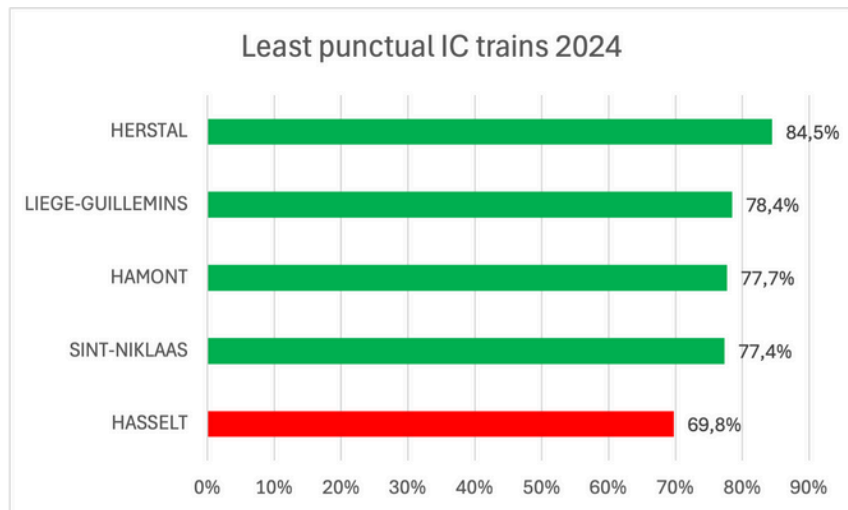
# Punctuality IC trains 2024



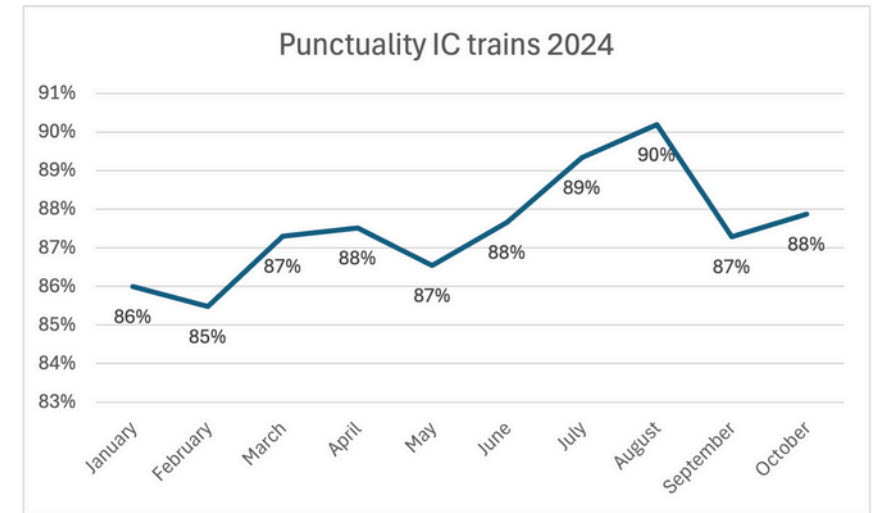
IC tracking of yearly punctuality trends, highlighting a dip in 2023 and a recovery to 87.5% in 2024.

As the IC trains operate the most in Belgium, the four graphs focus specifically on punctuality trends for these trains. Punctuality in 2023 showed a decrease compared to 2020, likely due to the lower operational impact and fewer trains running during the COVID-19 period. Although punctuality is gradually improving, continuous monitoring is necessary.

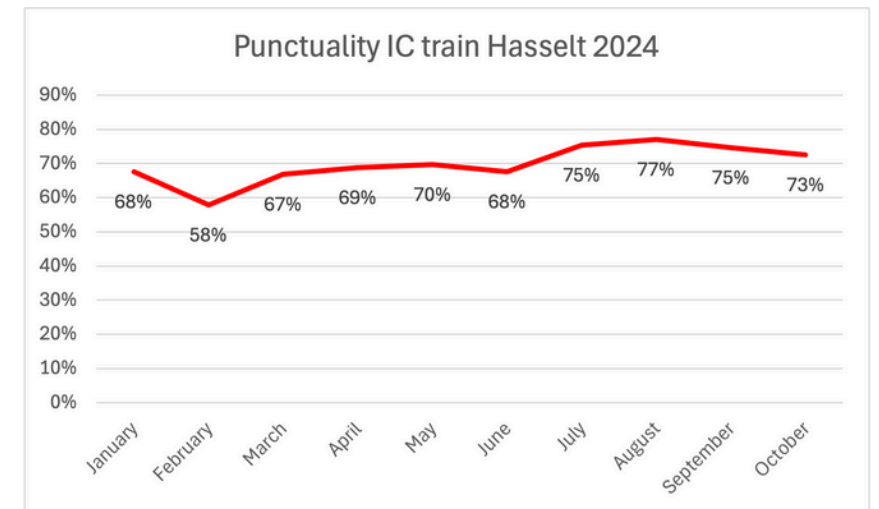
In 2024, Hasselt stands out with a significantly lower punctuality rate compared to other IC train stations. Seasonal patterns, consistent with previous years, indicate better punctuality in Spring and Summer, with a noticeable decline in Autumn and Winter. This highlights the need for additional attention and planning during these seasons to address the seasonal dip in performance.



Identifies the 5 least punctual locations, spotlighting Hasselt as the lowest performer at 69.8%, signaling local challenges.

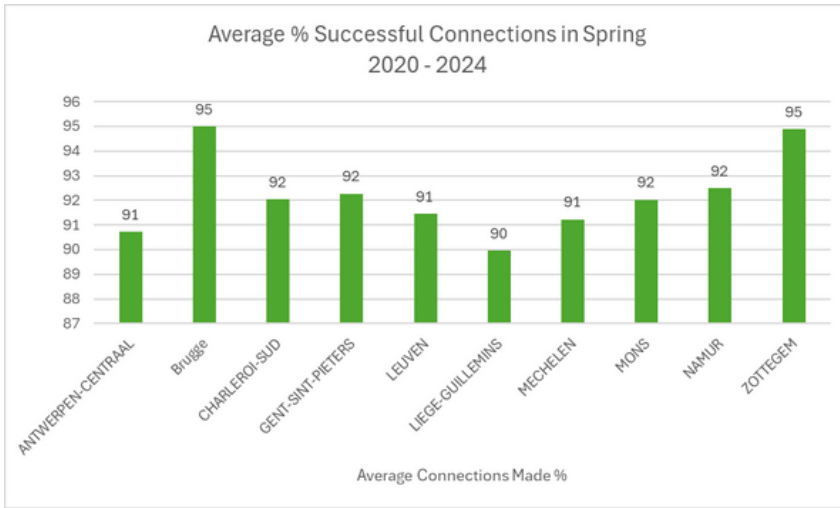


Reveals seasonal patterns, with summer having higher punctuality rates and autumn showing a notable decline.

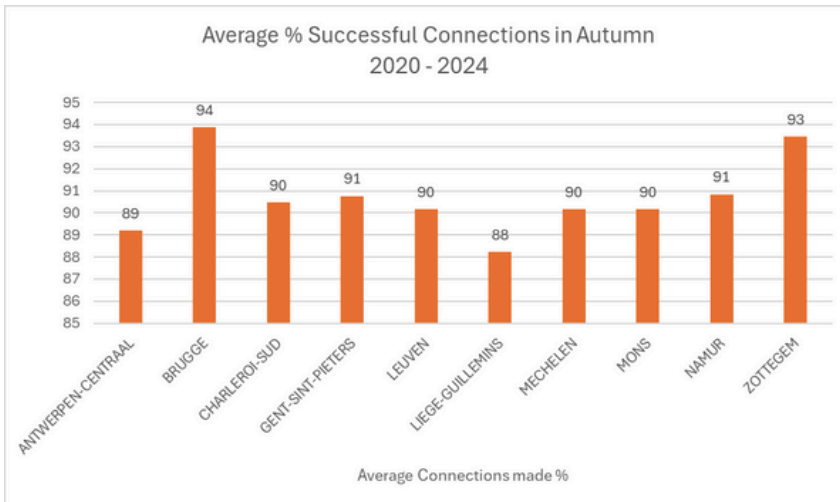


Pinpoints Hasselt's persistent issues, helping prioritize interventions in one of the most challenging regions for IC trains.

# Percentage of Connections Made



Shows 2020-2024 spring success rates; Brugge/Zottegem lead at 95%, while Liege-Guillemins lags.



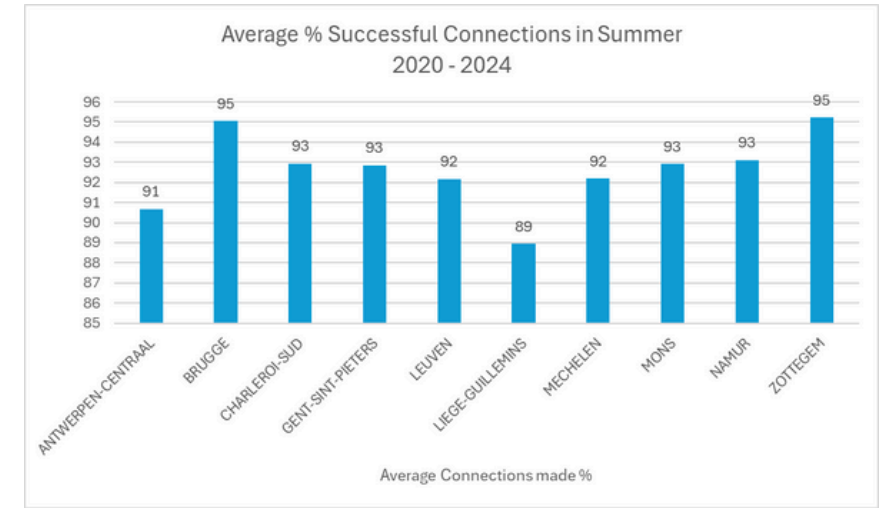
Highlights autumn low performance; Liege-Guillemins at 88%, with delays rising in Sept-Nov. Seasonal challenges are evident.

From the following graphs, we can see the percentage of successful train connection per train station, in each season from 2020 to 2024.

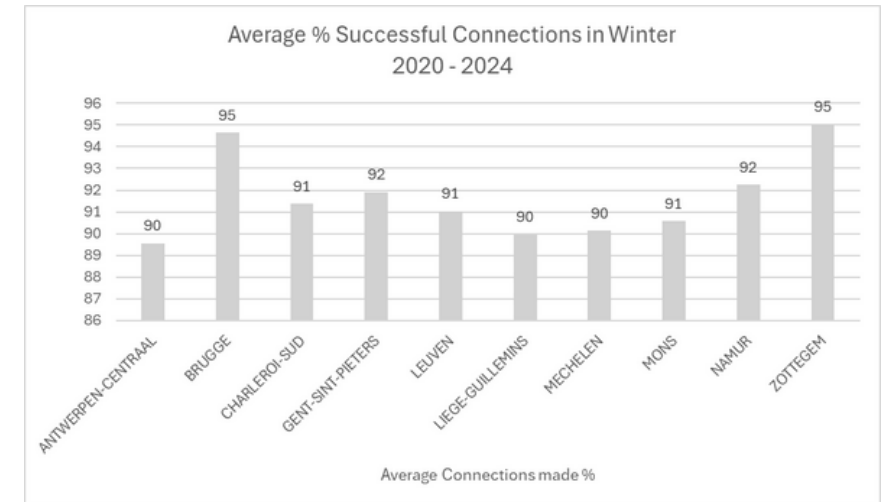
From the represented data, we can see that there is generally a positive rate of successful connections throughout the four seasons with Brugge And Zottegem leading with an average of 95%. On the opposite spectrum, we can see that Liege-Guillemins has a consistently lower rate of successful connections, with Autumn being the worst at an 88% of successful connections.

When connecting this with the preceding data, there is a significant issue with connections made and delays between the months of September, October and November (Autumn).

This visualization can also be seen when assessing the punctuality of IC trains in 2024. After an impressive 90% rate of punctuality in August, the percentage decreases back to 87% in September and remains relatively constant afterwards.



Evaluates summer connections; steady rates with Brugge/Zottegem at 95%, reflecting positive performance from both stations.



Assesses winter performance; Brugge/Zottegem steady at 95%. Consistency maintained despite colder weather impacts.



# Conclusion

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The analysis shows several factors contributing to train delays and inefficiencies, particularly during the autumn season, when punctuality and successful connection rates tend to decline. The INT train type consistently underperforms, demonstrating both frequent and long delays. There are a series of reasons why the autumn season may bring more disruptions, such as weather changes, leaves falling on tracks, and increased train traffic due to school schedules (Networkrail 2023). Additionally, specific locations like Hasselt experience significant punctuality issues, indicating potential infrastructure or scheduling issues.

As a recommendation, the engineering department should prioritize improving track maintenance during autumn by optimizing schedules for high-traffic locations. Along with that, they should consider paying specific attention for underperforming train types such as INT and underperforming IC locations, such as Hasselt. By focusing on these recommendations, the railway system can enhance overall punctuality and passenger satisfaction, ensuring growth and reliability.