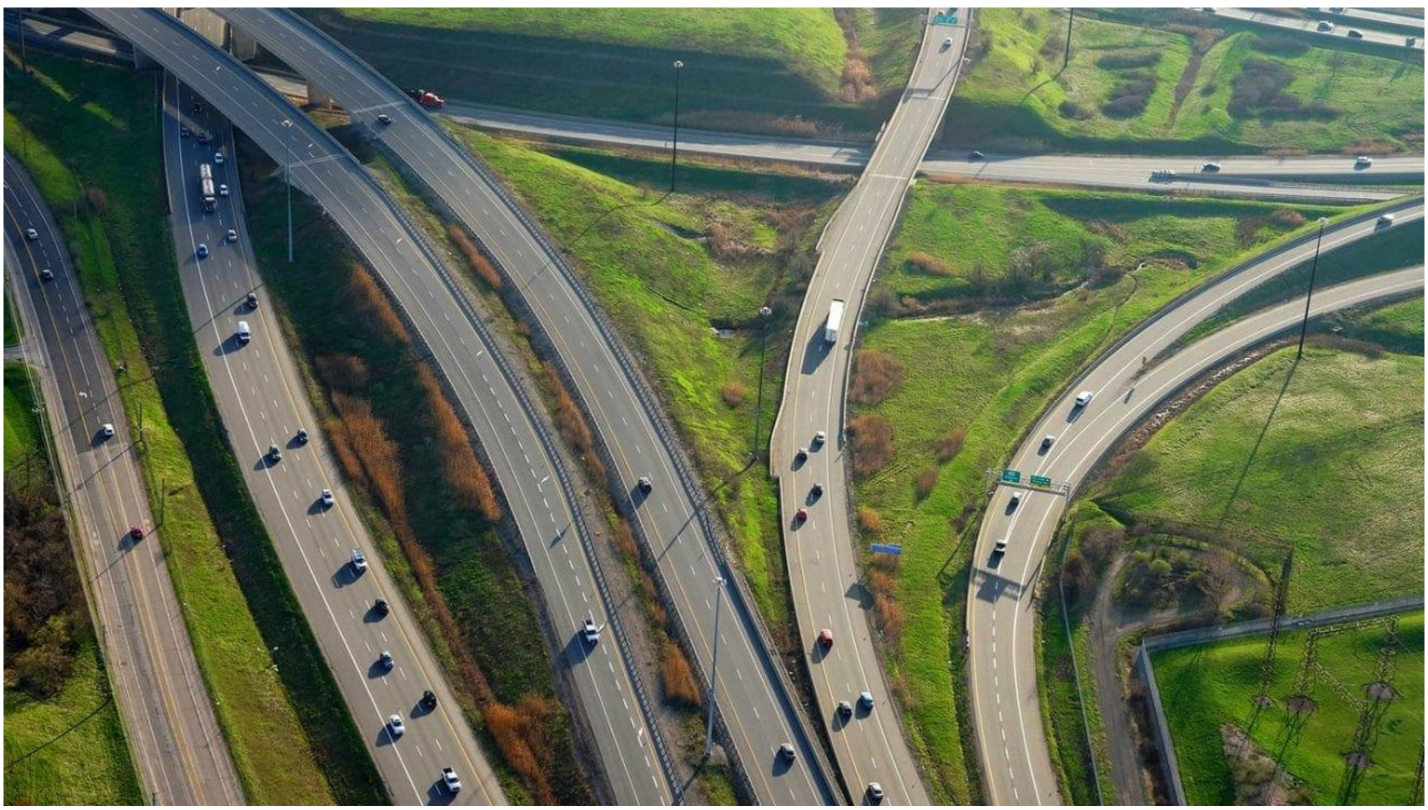
Final Report
May 2025

# Economic and Community Impact of Cintra Assets



Cintra US Services LLC
24890101

Final Report
May 2025

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# Executive Summary

### Overview

This report summarizes the 2025 **Economic and Community Impact of Cintra Assets** Study ('the Study'), which analyzed Cintra's portfolio of highway and managed lanes assets in North America. This analysis includes two key dimensions:

- **Impacts to Regional Economies –** understanding how expenditure on these assets generates impacts to employment and economic output, which represents the value of industry production; and
- **Impacts to Travelers and Communities –** understanding how each project generates value to travelers and the communities in which Cintra's facilities are located through the application of standardized transportation benefit-cost analysis.

This Study is an update to the 2023 **Economic and Community Impact of Ferrovial Toll Roads Report**, and includes the following key changes:

- Focuses solely on Cintra's North American assets, rather than the global outlook of the previous Study
- Includes an Impacts to Travelers and Communities assessment for I-66 Outside the Beltway (opened 2022) for the first time
- Updates the assessment of NTE 35W extension to include the Segment 3C expansion (opened 2023)
- Integrates two new full years of analysis (2023 and 2024) into all models, including Cintra's most recent data and updated data for other economic parameters; and
- Forecasts the potential future impacts to regional economies of assets through to 2034 (10 years).

### Assets Included in Analysis

This Study analyzed Cintra's 6 assets in the United States and Canada:

- Lyndon B. Johnson (LBJ) Expressway in Dallas-Fort Worth, TX
- North Tarrant Express (NTE) in Dallas-Fort Worth, TX
- North Tarrant Express 35W (NTE35W) in Dallas-Fort Worth, TX
- I-66 Outside the Beltway, VA
- I-77 Express Lanes, NC
- 407 ETR Highway, Ontario, Canada[1]

### Methodology

Each asset was analyzed with a consistent methodology to determine **Impacts to Regional Economies** (outcomes associated with spending on infrastructure) and **Impacts to Travelers and**

[1] Note that the in Canada study includes solely the 407 ETR, and not the two subsequent extensions to the 407.

**Communities** (changes to value to travelers and communities due to investment in the transportation network).

**Impacts to Regional Economies** were estimated using an industry standard Input Output (IO) model calibrated on two data sources:

- **For US assets -** US Bureau of Economic Analysis. RIMS II data for 2023 and
- **For Canadian asset(s) -** OECD, Input-Output tables for 2019

**Impacts to Travelers and Communities** were estimated using a blend of asset specific data (such as travel volumes, speeds, and travel time reliability before and after asset delivery) and standard economic factors and parameters (such as value of time or value of greenhouse gas emissions). Results were estimated in line with peer practice applied by infrastructure investors, regulators, and public sector agencies. This analysis used a methodology based upon regional and national evaluation approaches from the jurisdictions where Cintra assets are located.

Note that these methodologies have been combined for global application to allow for seamless application across all Cintra assets. As a result, it should not be used as a substitute for asset-specific economic evaluations. These evaluations may make use of data, tools, and methods that are asset specific and cannot be deployed across a whole portfolio. As a result, they may differ from the impacts estimations included in this Study. The evaluation includes the estimation of benefits to travelers (from faster and more reliable travel times), Impacts to Communities (changes in emissions and health impacts, which could be positive or negative), and Wider Economic Impacts (changes to the overall productivity of a region resulting from improved transportation).

This Study builds upon the Study released in 2023, by including an additional two years of analysis (2023 and 2024) and by including changes in asset usage and traffic as travel patterns continue to evolve alongside wider macro-economic trends. Volumes and travel speeds may be different for some assets compared to the previous analysis. Additionally, as macro-economic changes occur, the value and level of impacts to regional economies from expenditure can change as well, which has an effect on the Study results. It should also be noted that the number and types of assets included in this Study are limited to Cintra's North American assets. The price base in which impacts are reported has also been adjusted from 2022 prices to 2024 prices.

### Overarching Findings

Estimates for Impact to **Regional Economies** is shown in **Table E.1**, while Impact to **Travelers and Communities** is shown in **Table E.2**.

**Table E.1: Impact to Regional Economies, USD, 2024 $M**

| | Estimated Historic Performance | | | Forecast Future Performance (2025-2034) | | |
|---|---|---|---|---|---|---|
| | Economic Output | Salary Earnings | Employment (FTE) | Economic Output | Salary Earnings | Employment (FTE) |
| US | $31,700 | $9,000 | 152,000 | $6,600 | $1,900 | 31,700 |
| Canada | $16,100 | $4,600 | 82,200 | $4,100 | $1,200 | 21,000 |
| **Total** | **$47,800** | **$13,600** | **234,200** | **$10,700** | **$3,100** | **52,700** |

Table E.1 notes a significant Impact to Regional Economies. An estimated $47.8 billion in economic output has been generated over the asset lifecycle through to year-end 2024. In addition, $13.6 billion in salary earnings were generated by the Cintra's current assets over their lifecycle through to year-end 2024. Over the same period, there have been an estimated 234,200 Full Time Equivalent (FTE) job-years of labor generated to construct and maintain/operate the assets.

Over the 2025-2034 period, an additional $10.7 billion of economic output, $3.1 billion of salary earnings, and an estimated 52,700 Full Time Equivalent (FTE) job-years of labor are forecasted to be generated from the construction and maintenance/operations of the current portfolio.

**Table E.2: Impacts to Travelers and Communities, USD, 2024 $M**

| | Estimated Historic Performance | | | Forecast Future Performance (2025-2034) | | |
|---|---|---|---|---|---|---|
| | Total Impacts | Impacts to Travelers | Impacts to Communities | Total Impacts | Impacts to Travelers | Impacts to Communities |
| US | $17,300 | $7,700 | $9,600 | $28,400 | $12,800 | $15,600 |
| Canada | $19,100 | $16,000 | $3,100 | $7,600 | $6,400 | $1,200 |
| **Total** | **$36,400** | **$23,700** | **$12,700** | **$36,000** | **$19,200** | **$16,800** |

**Table E.2** notes a range of Impact to Travelers and Communities **–** including $36.4 billion in value realized to date from Cintra's current assets. This includes $23.7 billion of direct Traveler Impacts (from faster and more reliable travel times), and $12.7 billion in Community Impacts, consisting of $8.5 billion in External Impacts (changes in collisions and emissions), and $4.2 billion in Wider Economic Impacts (reflecting improved productivity due to decreased travel times). The forecasts for the 2025-2034 period notes an estimated additional benefit of $36.0 billion, which is comprised of $19.2 billion of direct Traveler Impacts, and $16.8 billion in Community Impacts, comprised of $13.5 billion in External Impacts and $3.3 billion in Wider Economic Impacts.

*Future results for Impacts to Travelers and Communities and Impacts to Regional Economies may vary from these depending on the assets Cintra includes in its portfolio and broader economic and demographic trends.*

# 1 Introduction

## 1.1 Overview

Steer conducted an analysis of Cintra's North American portfolio of highway and managed lanes (excluding 407 Ext 1 and 2) assets with a focus on:

- Impacts to **Regional Economies –** understanding how expenditures on these assets generate regional impacts, including economic output, earnings, and employment.
- Impacts to **Travelers and Communities –** understanding how each project generates value to travelers, and communities through the application of standardized transportation benefit-cost analysis.

This document is the final report for this Study and has been prepared to summarize the methodology and main findings.

## 1.2 Study Purpose

This Study assessed the global impact of 6 highway and managed lane assets using a comprehensive approach that applied three principles:

- **Consistent –** the same methods and overall approach to analysis are applied to all assets. Some assets may use specific methods or data sets, but efforts have been made to standardize the analysis.
- **Robust –** the methods draw upon relevant practice from peer studies and public agencies who conduct economic appraisal of transportation investment. Methods are directly traceable to accepted practice for both the Impacts to Travelers and Communities and the Impacts to Regional Economies.
- **Scalable and repeatable –** the methods can be applied to other assets and used for future year analysis.

A methodology was developed that balances these principles against available data and asset specific context across North America.

### 1.2.1 Study Usage and Limitations

This Study draws upon available evidence and information on historic and projected asset performance alongside regional and national data to estimate impacts to regional economies. The outputs of this analysis can be used for a range of purposes, including internal asset planning, investment engagement, and project reviews.

## 1.3 Portfolio Overview

This Study analyzed Cintra's 6 assets in the United States and Canada, for both their Impact to Regional Economies and to Travelers and Communities. **Table 1.1** summarizes the key aspects of each asset considered in the analysis.

**Table 1.1: Summary of Cintra asset portfolio analyzed for economic and traveler/community impacts**

| | Asset | Location | Length, (mi) | Start of Concession | Opening Year[1] |
|---|---|---|---|---|---|
| 1 | NTE | TX, US | 13 | 2009 | 2014 |
| 2 | LBJ | TX, US | 13 | 2009 | 2015 |
| 3 | NTE35W | TX, US | 17 | 2013 | 2018 |
| 4 | I-66 | VA, US | 23 | 2016 | 2022 |
| 5 | I-77 | NC, US | 26 | 2014 | 2019 |
| 6 | 407 ETR | ON, Canada | 67 | 1999 | 1999 |

1: Note the opening year may differ from first full year of Impact to Travelers and Communities as we have started the analysis with the first full calendar year of operations.

## 1.4 Report Structure

The remainder of this report is structured as follows:

- **Chapter 2 – Impact Estimation Methodology –** a summary of the methodology used to analyze each asset
- **Chapter 3 – Results –** the detailed results for each asset included in the analysis
- **Chapter 4 – Conclusions –** a summary of the Study findings, and an overview of key changes compared to the previous 2023 report

# 2 Impact estimation methodology

## 2.1 Overview

This chapter provides an overview of the overarching methodology for estimating the economic performance of Cintra's global assets. It includes the following sections:

- **2.2: Logic Framework** – a summary of how Cintra's assets generate benefits to travelers, communities, and the overarching economy.
- **2.3: Methodology Overview** – a high-level summary of the approach used to estimate benefits.
- **2.4: Impacts to Regional Economies** – a detailed methodology for estimating two key impacts to regional economies – change in economic output and employment.
- **2.4: Impacts to Travelers and Communities** – a detailed methodology for estimating the benefits to Travelers who use Cintra assets as well as Wider Economic Impacts associated with their use.

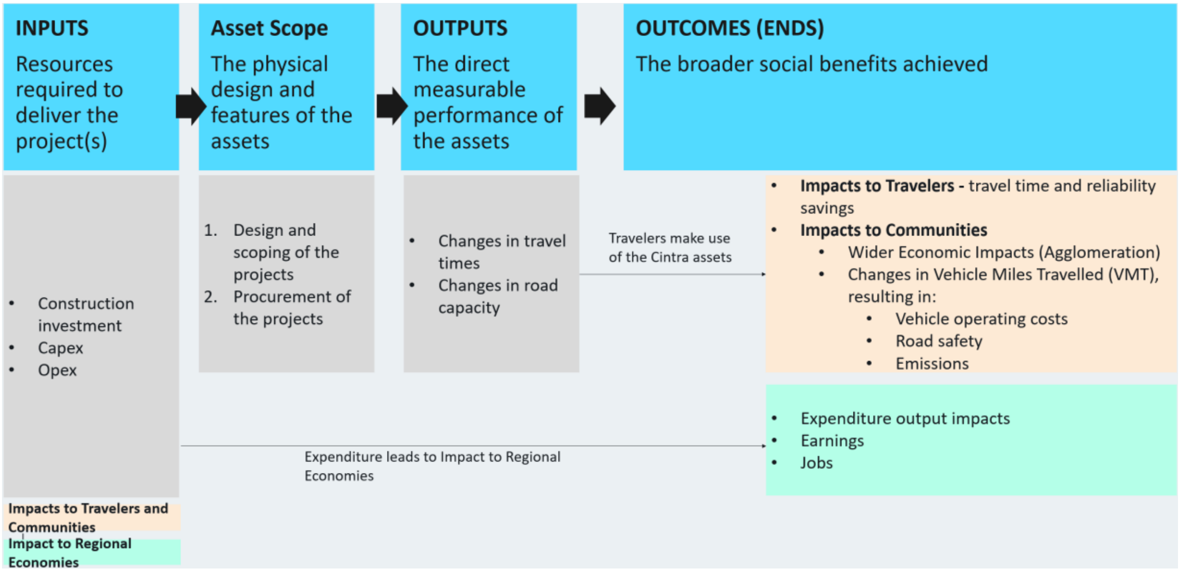
## 2.2 Logic Framework

This Study assessed how Cintra's assets impact regional economies, travelers, and communities. The Study made use of the logic framework presented in **Figure 2.1** which is an explicit representation of how Cintra's assets were evaluated. This framework describes the process where the investment of resources to build and operate the road assets transforms into outcomes for the community and the regional economy.

For example, investing in the design, development, and operations of new roads generates additional expenditure in the regional economy. This effect results in additional economic output, earnings, and jobs for workers.

Similarly, these same investments modify mobility patterns, influencing both travel times and vehicle miles traveled (VMT). These primary effects subsequently generate measurable impacts to travelers and communities through changes in vehicle operating expenses, road safety outcomes, emission levels, and agglomeration economies. The resulting value affects both transportation network users and broader community stakeholders.

**Figure 2.1: Logic framework to evaluate the impacts to regional economies of Cintra assets**




Source: Steer

## 2.3 Methodology overview

The methodology to estimate the impact to **Regional Economies** and **Travelers and Communities** of Cintra assets was designed to achieve the following goals:

- Provide an overarching, consistent, standardized and comparable evaluation framework for Cintra's road assets across different countries.
  - The framework is designed to make use of available national, regional, and project data to understand impacts across assets and regions.
  - This analysis does not substitute project-specific economic evaluations, which are expected to use more in-depth analyses for more detailed economic estimations.
- Quantify the historical outcomes identified in the logical framework on a year-by-year basis, generally from the beginning of the concession, up to 2024, and then forecast outcomes over a reasonably foreseeable period, in this case, from 2025 to 2034 (10 years).

The methodology presented in **Table 2.1** quantifies the **Impacts to Regional Economies** and the **Impacts to Travelers and Communities** produced by the investment in road infrastructure across the portfolio.

**Table 2.1: Methodology summary for calculating the impact of Cintra's assets**

| Type of impact | Definition | Overarching Method | Impacts quantified |
|---|---|---|---|
| **Impact on Regional Economies** | Direct, secondary, and induced impacts of project expenditures on the economy of the region of influence. | Apply Input/Output models to convert each asset's capital and operational expenditures into economic outputs through economic multipliers. | **1. Economic output**<br>**2. Earnings**<br>**3. FTE Jobs** |
| **Impact on Travelers and Communities** | Assesses how Cintra's investments can impact travelers (changing speed/reliability of travel) as well as broader community benefits – as defined by pollution and collisions resulting in death or injury, compared to a scenario without investment. | Use a hypothetical no-project scenario and compare the incremental impacts between this and the project situation for each asset. | **1. Traveler Impacts**<br>• Travel time, reliability<br>• Vehicle operating costs<br>**2. External Impacts**<br>• Safety<br>• Emissions<br>**3. Wider Economic Impacts**<br>• Agglomeration (productivity) |

Source: Steer

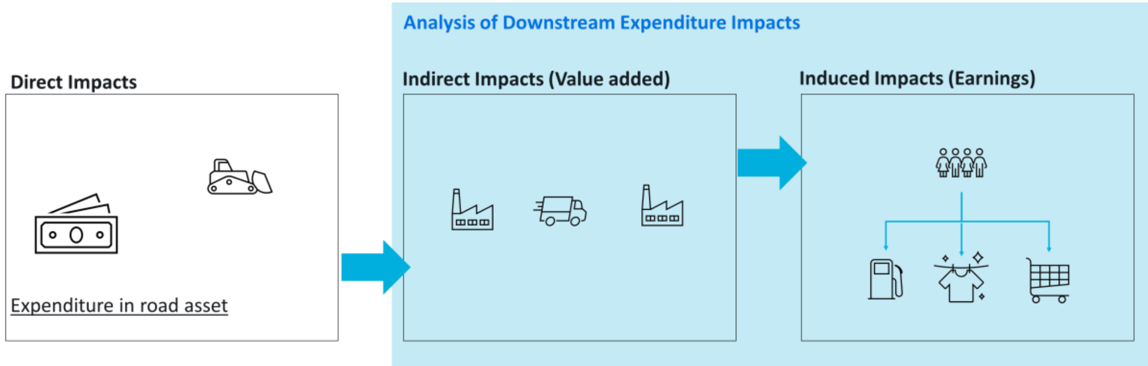
Sections 2.4 to 2.5 describe the impacts and the assumptions for each impact type.

## 2.4 Impacts to Regional Economies

Impacts to Regional Economies describe the direct, indirect, and induced impacts of spending on the economy. These are estimated with input-output (IO) models which use region-specific multipliers for precise expenditure impacts.

The IO analysis is a standard approach to quantify expenditure impacts. These models provide an estimate of the total economic output generated by the initial investment (Direct Impacts) that includes the production of intermediate goods and services in the supply chain (Indirect Impacts), as well as economic activity generated from the spending of workers (Induced Impacts) represented in **Figure 2.2**. The impacts also include an estimate of the jobs supported by the economic activity above, and the earnings that accrue to workers in the project region.

**Figure 2.2: Impacts to Regional Economies**




The methodology to estimate the Impacts to **Regional Economies** relies on a dual approach that uses region-specific expenditure multipliers (Regional Input-Output Modeling System II, RIMS II, 2023) for assets located in the United States and country-level multipliers for Canada. This approach supports the use of specific data when available and allows for comparability among the impacts estimated in the portfolio.

Both are widely accepted tools in the industry and their application follows economic impact analysis approaches aligned with government agencies – for example the **Federal Highway Administration in the USA**.

The estimation of the impacts to regional economies required the following inputs on an annual basis, which have been provided by Cintra:

- Construction investment
- Capital expenditures
- Operating expenses

*Methodology*

The general approach for calculation of the impacts to regional economies is outlined below:

- Steer created baseline input output models (industry transaction matrices and multipliers) in an Excel spreadsheet tool for each country.
- All dollar amounts were converted to standard US dollars based on exchange rates from the OECD and adjusted for inflation based on OECD GDP deflators.
- All inputs (construction investment, capital expenditures, operating expenses) were converted to a common price base (2024 USD).
- The developed tool estimates the year-by-year economic output, earnings, and jobs impacts for each asset.

US projects were analyzed with state-level, 'Transportation structures and highways and streets' RIMS II multipliers from the US Bureau of Economic Analysis. The RIMS II multipliers are only available for the US and cannot be used for non-US jurisdictions. The existing framework was then applied to calculate impacts for future years to 2034, using data provided by Cintra, along with projections for exchange rates and GDP deflators. Final impacts for all assets are all and standardized to 2024 USD.

## 2.5 Impacts to Travelers and Communities

Impacts to **Travelers and Communities** quantifies the value creation for both users and host communities where Cintra's infrastructure assets are situated. It is standard international practice to classify these transportation impacts as follows:

- **Traveler Impacts**
  - Travel time and reliability savings
  - Vehicle operating costs adjusted on a fuel consumption basis
- **External Impacts**
  - Road safety
  - Emissions
- **Wider Economic Impacts**
  - Agglomeration (productivity)

These methods are comparable to those used by government agencies and departments in the jurisdictions included in this Study, such as: **Metrolinx** (Greater Toronto and Hamilton Area, Canada), **Federal Highway Administration** (USA), and **Department of Transport** (UK).

Each adopt broadly similar approaches to transportation cost-benefit analyses, which involve assessing a project's benefits by comparing a 'no-project' (counterfactual) scenario against a 'with-project' scenario where a project (or asset) is constructed. Benefits are assessed in terms of their monetized impact to **wider society**, rather than their purely economic impact to GDP. The common approach adopted involves the following key principles:

1. Establish a 'no-project' counterfactual to represent the circumstance without the project
2. Calculate benefits and costs as the difference between the project and counterfactual scenarios.
3. Convert all impacts (time savings, safety improvements, emissions, etc.) into monetary values

Each of the Metrolinx, Federal Highway Administration and Department for Transport methods all capture the three groups of impacts described above. While there are differences in precise approaches to estimating impacts, and the parameters used, they form standard international practice for assessing transportation impacts globally.

### 2.5.1 Traveler Impacts

Traveler Impacts measure the economic value of improved consumer surplus experienced by travelers using a transportation investment – in this case, the new or improved road. Transportation investments may provide travel time and reliability savings to travelers who switch to using the investment instead of alternative routes or modes.

Calculating these impacts requires establishing a counterfactual (no-project) scenario, that reflects what would have happened if the project would have not been built. The Traveler Impacts are then the differential between the counterfactual and the project situation.

Cintra's North American road assets portfolio covers projects with two distinct operating characteristics that require different assumptions for their counterfactual scenarios. **Table 2.2** summarizes the classification of the road projects in the portfolio and their no-project situation assumptions.

**Table 2.2: Summary of counterfactual assumptions per type of road asset**

| No. | Type of asset | Counterfactual Assumption | Assets |
|---|---|---|---|
| 1 | **Managed lanes**<br>Projects that implement tolled lanes (ML) along the same corridor.<br><br>The counterfactual alternative is the toll-free project corridor without the MLs. | Calculated no-project travel times scenario in the project corridor by simulating speed and flow in a situation where traffic evolves over time, and capacity is not increased.<br><br>This approach uses traffic data from before the asset was completed to simulate future traffic speeds if the project (ML) was not built. The simulations explore how traffic could have changed without the asset and the corresponding impacts on travel time and reliability on the corridor. | • NTE<br>• LBJ<br>• NTE35W<br>• I-66<br>• I-77 |
| 2 | **Urban toll road**<br>Projects spanning a metropolitan area and have a non-tolled alternative on a separate route. | Calculated no-project travel times scenario in the non-tolled alternative by simulating speed and flow in a situation where traffic evolves over time and capacity is not increased.<br><br>This approach simulates future traffic speeds if the project (Urban toll road) would have not existed. The assumption uses available traffic and speed data to simulate how traffic volumes, and therefore travel times, would have evolved on the alternative road if the Urban toll road was never built. | • 407 ETR |

Source: Steer

Traveler Impacts for toll road investments primarily cover three effects:

- **Travel time –** The average time to use the whole asset, compared with the counterfactual situation, by time period.
- **Trip reliability –** The difference between the maximum and the average travel time to use the whole asset, compared with the counterfactual situation, by time period.

- **Vehicle operating costs –** Observed fuel and maintenance costs to use the project, compared to a no-project situation, based on distance traveled in miles.[2]

These impacts are quantified for the following travelers:

- **Travelers using the asset –** traffic data from each asset was used alongside historic data to estimate impacts.
- **Travelers using the best alternative to the asset** – project data for highways and managed lanes was used to estimate potential impacts to travelers who do not use the asset but make use of alternative roadways. Travelers on these 'alternative roadways may benefit from reduced congestion when other travelers switch to the roadway asset.

**Table 2.3** summarizes the approach used to collect the data to estimate Traveler Impacts.

**Table 2.3: Traveler Impacts calculation approach**

| Step | Description | Data Source |
|---|---|---|
| 1. Identify alternative segments | For each asset, the analysis identified the most appropriate alternative.<br>The evaluation focused on a complete trip across the project and its substitute alternative. | Geospatial process using Google maps |
| 2. Collect travel times, reliability times and distances for the project and its alternative | Using coordinates from Step 1 and a web-based mapping platform, Step 2 consisted in collecting travel times, reliability times and distances for the project and the alternative.<br>Travel time and reliability data were collected for peak (both AM and PM) and inter-peak periods. | Travel times and reliability: Bing; Google and/or Waze maps.<br><br>Reliability times: Google maps |
| 3. Process travel and reliability times to build the counterfactual scenarios | Data collected in Step 2 were processed and combined with historical traffic data provided by Cintra, and modeling of how traffic speed varies within increasing traffic volumes, to build the counterfactual scenarios described in Table 2.2. | Cintra, with analysis from Steer |
| 4. Calculate travel, reliability time savings and vehicle operating cost savings | Built an Excel tool to calculate the travel time and reliability impacts.<br>The tool also calculated vehicle operating costs changes[3], by estimating differences in total Vehicle Miles | Steer analysis |

[2] Note other operating costs such as tolls have been excluded from analysis. In standard Benefit-Cost Analysis these payments are considered a transfer (an example is the Australian Transport Assessment and Planning Guidance).

[3] Vehicle operating costs were adjusted for the relationship between speed and fuel consumption using estimates from Barth and Boriboonsomsin (2009). Estimates of the speed-fuel consumption curves were derived using R's Digitize package.

| | | |
|---|---|---|
| | Traveled (VMT) between the project and counterfactual scenario.<br>The impacts were estimated by asset, on a yearly basis, for peak and off-peak periods. | |
| 5. Monetize impacts using country specific values of time and automobile operating costs parameters. | The Excel tool monetized the travel time, reliability savings[4] using a country-level value of time.<br><br>The tool also calculated the change in vehicle operating costs as a function of change in VMT.<br><br>Monetized impacts (in 2024 USD) were calculated by the following combination of categories:<br>• Asset<br>• Year-by-year, for every full year of operation of the asset<br>• Peak and off-peak periods<br>• Light and heavy vehicles<br>• Pre-existing and new demand | Country-level traveler and community impact guidance documentation |

*Treatment of demand*

Demand included in this analysis is split into 'pre-existing' demand and 'induced' demand. Pre-existing demand includes all trips that were made on the highway network before the asset was delivered. Some pre-existing trips switch to the asset and realize a direct benefit, while other pre-existing trips that do not use the asset could benefit from reduced congestion.

New or 'induced' demand represents trips that were not made before the asset was delivered. Induced demand includes two types of trips: those who change mode from a non-auto mode and 'net new' trips that were not made previously. Investment in infrastructure can generate net new trips that would not have otherwise occurred by reducing travel time or improving traveler experience.

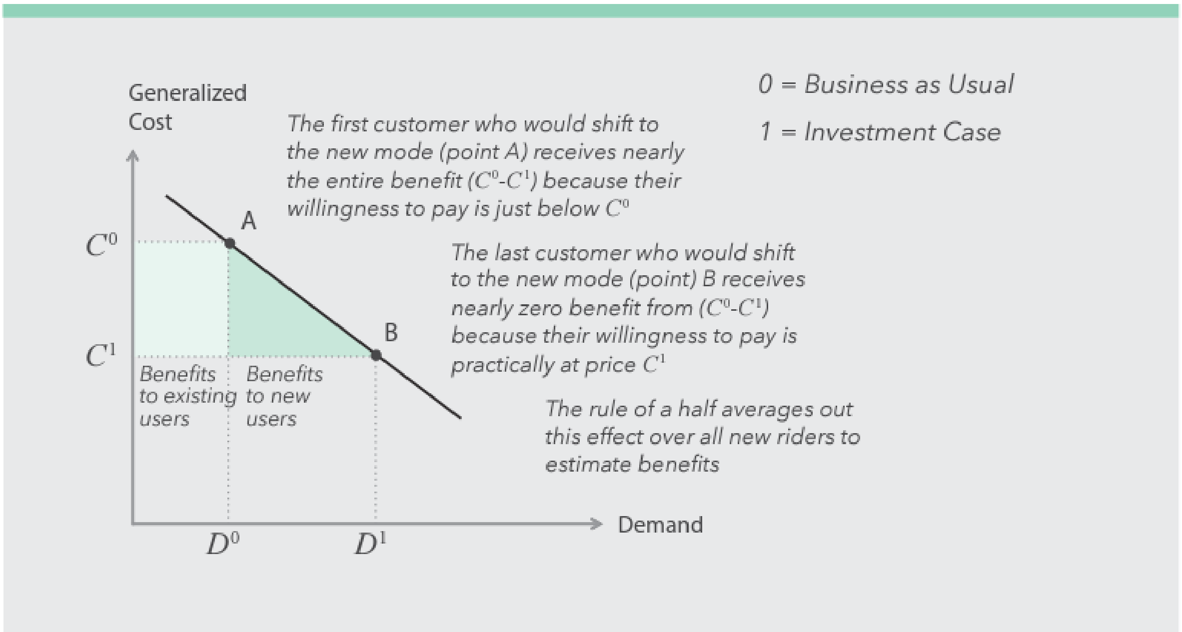
The calculation of induced demand used an elasticity-based methodology that estimates the effect of changes in travel time to additional VMT in a road asset, based in Barr (2000). This estimates, of the total traffic volume on each asset today (from Cintra data), the share of this traffic which is 'induced' solely by the reduction in travel time generated by the asset, as opposed to background traffic growth which would have occurred in any event.

The 'rule-of-a-half' approach (whereby impacts are multiplied by 0.5) is applied to the Traveler and External Impacts generated from induced demand, as per international Benefit-Cost Analysis practice. This employs a simplifying assumption that the travel cost-demand curve for transportation is linear, and the benefit each 'new' user receives is half (0.5) that of an 'existing'

[4] Reliability savings are valued based on **Metrolinx Business Case Manual Volume 2: Guidance**.

user. This allows impacts to be estimated for 'new' users without having complete information on what level of travel time saving would be needed for them to change their travel behaviour to make an additional trip on the asset. The theoretical basis behind this approach is visualized below in **Figure 2.3**

**Figure 2.3: Rule of a Half for Traveler Benefit Estimation**




Source: Metrolinx Business Case Manual Volume 2: Guidance

### 2.5.2 External Impacts

The external impact category consists of the quantification of changes in road safety and emissions associated with the asset.

*Road Safety*

Collisions resulting in death or injury are typically measured on a per VMT basis. Standard Benefit-Cost Analysis practice uses a change in VMT to estimate the overall impact in these externalities that results from changes in preferred route distance, and the project accident rates, given an improved infrastructure design.

The safety methodology for North American assets has been revised from the Study published in 2023 to take advantage of the availability of new traffic accident data by state that allows us to estimate safety impacts using a more sophisticated analysis of accident severity. This change in methodology means that the analysis more accurately reflects the costs to communities associated with collisions involving injuries and fatalities.

The road safety impacts are calculated using the following approach:

- Calculation of the project and no-project situation VMTs by the following categories:
  - Asset

  - Year-by-year
  - Peak and off-peak periods
- Calculation of accident rates for a no-project situation, multiplying VMTs by a no-project accident rate.
  - The no-project accident rate assumptions were informed by the most recent state-level accident statistics per VMT available at the time of analysis.
- Calculation of accident rates for a project situation, multiplying VMTs by a project accident rate.
  - The project accident rates were drawn from observed historical VMT accident rates on each Cintra asset.
- Calculation of the differential of number of accidents between the no-project and project situation, using an Excel tool.
- Quantification of the road safety impacts in 2024 USD, using US Department of Transportation November 2024 Benefit-Cost Analysis Guidance and the National Highway Traffic Safety Administration. The cost of fatal and injury accidents is represented by an average of the fatal and injury collision dollar values weighted by the number of fatal and injury collisions, respectively.[5]

[5] The weights are taken from the National Highway Safety Administration ***Overview of Motor Vehicle Crashes in 2020*** *report.*

*Emissions*

The estimation of emissions externalities follows the US Department of Transportation November 2024 Benefit-Cost Analysis Guidance, and considers the impacts associated with carbon dioxide ($CO_2$) emissions, and local air pollutants generated by road traffic (nitrogen oxides [$NO_x$] and fine particle matter [$PM_{2.5}$]). The analysis excluded sulfur dioxide emissions ($SO_2$) as there was no fully wide available statistical information on $SO_2$ emissions per type of vehicle at a country/regional level.

The emissions methodology reflects the updated values by pollutant within the November 2024 Guidance, which significantly increased the damage costs of emissions per metric ton following new research by the Environmental Protection Agency, particularly for $CO_2$. Between the 2022 and 2024 guidance, the 2024 value for one metric ton of $CO_2$ emissions increased from $55 to $241. This increase in the damage costs of emissions has led to a significant increase in External Impacts across all assets in this Study compared to the previous. Emissions rates (tons per vehicle mile) are derived from US Bureau of Transportation Statistics data.

Note that the emissions method considers speed within the calculation of emissions, rather than assuming constant emissions rates per vehicle mile traveled irrespective of fuel consumption at different speeds.

The emission impacts are calculated using the following approach:

- Calculation of the project and no-project situation VMTs, by the following categories:
  - Asset
  - Year-by-year
  - Light and heavy vehicles
  - Peak and off-peak periods
  - Average vehicle speed
- Calculation of emission rates per type of pollutant for a no-project and project situation multiplying VMTs by a per mile emission rate for each pollutant.[6]
- Calculation of the differential emissions per pollutant between the no-project and project situation, using an Excel tool.
- Quantification of the differential emissions in 2024 USD, using a monetary value per pollutant, based in the US DOT guidance.

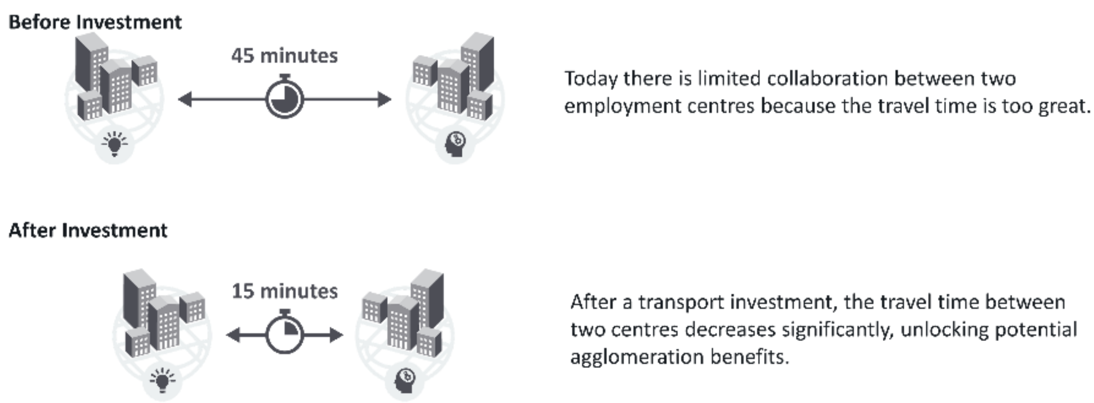
### 2.5.3 Wider Economic Impacts

*Agglomeration (productivity)*

In addition to Traveler and External Impacts, transportation projects can realize Wider Economic Impacts when they enable faster and more seamless travel between centers of economic activity. Specifically, agglomeration impacts refer to the gains in productivity from clustering by

[6] Vehicle emissions were adjusted for the relationship between speed and fuel consumption using estimates from **Barth and Boriboonsamson (2009)**. Estimates of the speed-fuel consumption curves were derived using R's Digitize package.

firms/education centers/other economic agents that is possible when travel times reduce between these centers.




Approaches to calculate agglomeration based on empirical evidence have been set out in academic literature, including Graham et al. (2010). The typical assessment approach (applied by UK Department for Transport and other agencies) involves:

- Calculating the existing 'effective density' of a given activity center – effective density is estimated as the number of jobs accessible from that center divided by the travel time to access them, a decay parameter is used to reflect that productivity gains are not linear (job centers that are twice as far apart are likely to have less than half the productivity gains);
- Calculating a change in travel time from a proposed investment and its impact on effective density; and
- Using the change in effective density to estimate an impact on productivity based on an agglomeration elasticity (which related effective density to GDP per worker).

These impacts are accrued when transportation projects increase the spatial concentration or effective density of regions. These impacts will vary by the industry composition within the localities of the transportation project. Since the range of data required to estimate agglomeration for the portfolio are not available, an exploratory methodology was developed instead based on available information and peer examples. The methodology estimated agglomeration impacts by applying a 'percent uplift' to the monetized Traveler Impacts of each asset on a year-by-year basis. The agglomeration value employed is an average value between the highest and lowest agglomeration parameters from Graham (2008), of 16.5%.

**Table 2.4: Appraisal of agglomeration impacts from transport investments**

| Mode | Scheme | Agglomeration |
|---|---|---|
| Road | Leeds to Bradford Improved Highway | 21% |
| Road | Leeds Urban Area Improved Highway | 22% |
| Road | Leeds to Sheffield Improved Highway | 19% |
| Road | M6 shoulder | 12% |

Source: Graham (2008)

# 3 Results

## 3.1 Overview

This chapter presents the overall results of the Impacts to Regional Economies (Section 3.2) and Impacts to Travelers and Communities (Section 3.3) of Cintra's current portfolio.

## 3.2 Impacts to Regional Economies

The total Impacts on **Regional Economies** are presented in **Table 3.1** and **Figure 3.1**. Estimates note that up to 31st December 2024, Cintra's current road portfolio investment has produced a total economic output of $47.8 billion (2024 prices). This investment has also led to $13.7 billion (2024 prices) of workers earnings and 234,200 Full Time Equivalent (FTE) job-years.

**Table 3.2** presents these results as an average annual expenditure impacts per asset, considering the years since the concession started as the base year.

**Table 3.3** and **Figure 3.2** present the projected Impacts to Regional Economies for the 2025-2034 period. Cintra's road portfolio investment is estimated to produce a total economic output of $10.7 billion (2024 prices). This investment also leads to $3.1 billion (2024 prices) of workers earnings and 52,600 Full Time Equivalent (FTE) job-years. This analysis assumes Cintra's continued ownership and involvement in these assets. The full impacts of all assets were assessed and reported on regardless of the proportion of equity of those assets that belongs to Cintra.

**Table 3.4** presents the projected impact results for the 2025-2034 period as an average annual expenditure impacts per asset, considering the years since the concession started as the base year.

**Table 3.1: Summary of cumulative Impacts to Regional Economies for current Cintra assets up to 2024, 2024 $M**

| | Asset | Location | Years of Impact | Economic output | Earnings | FTE Jobs (job-years) |
|---|---|---|---|---|---|---|
| 1 | NTE | TX, US | 16 | $7,200 | $2,100 | 34,800 |
| 2 | LBJ | TX, US | 15 | $8,100 | $2,300 | 39,100 |
| 3 | NTE 35W | TX, US | 12 | $8,500 | $2,500 | 41,100 |
| 4 | I-66 | VA, US | 8 | $5,700 | $1,600 | 26,500 |
| 5 | I-77 | NC, US | 11 | $2,200 | $600 | 10,500 |
| 6 | 407 ETR | ON, Canada | 25 | $16,100 | $4,600 | 82,200 |
| | **Total** | | | **$47,800** | **$13,700** | **234,200** |

**Table 3.2: Summary of average annual Impacts to Regional Economies for current Cintra assets up to 2024, 2024 $M**

| | Asset | Location | Years of Impact | Economic output | Earnings | FTE Jobs (job-years) |
|---|---|---|---|---|---|---|
| 1 | NTE | TX, US | 16 | $450 | $130 | 2,200 |
| 2 | LBJ | TX, US | 15 | $540 | $150 | 2,600 |
| 3 | NTE 35W | TX, US | 12 | $710 | $210 | 3,400 |
| 4 | I-66 | VA, US | 8 | $710 | $200 | 3,300 |
| 5 | I-77 | NC, US | 11 | $200 | $50 | 950 |
| 6 | 407 ETR | ON, Canada | 25 | $640 | $180 | 3,300 |
| | **Total** | | | **$3,250** | **$920** | **15,750** |

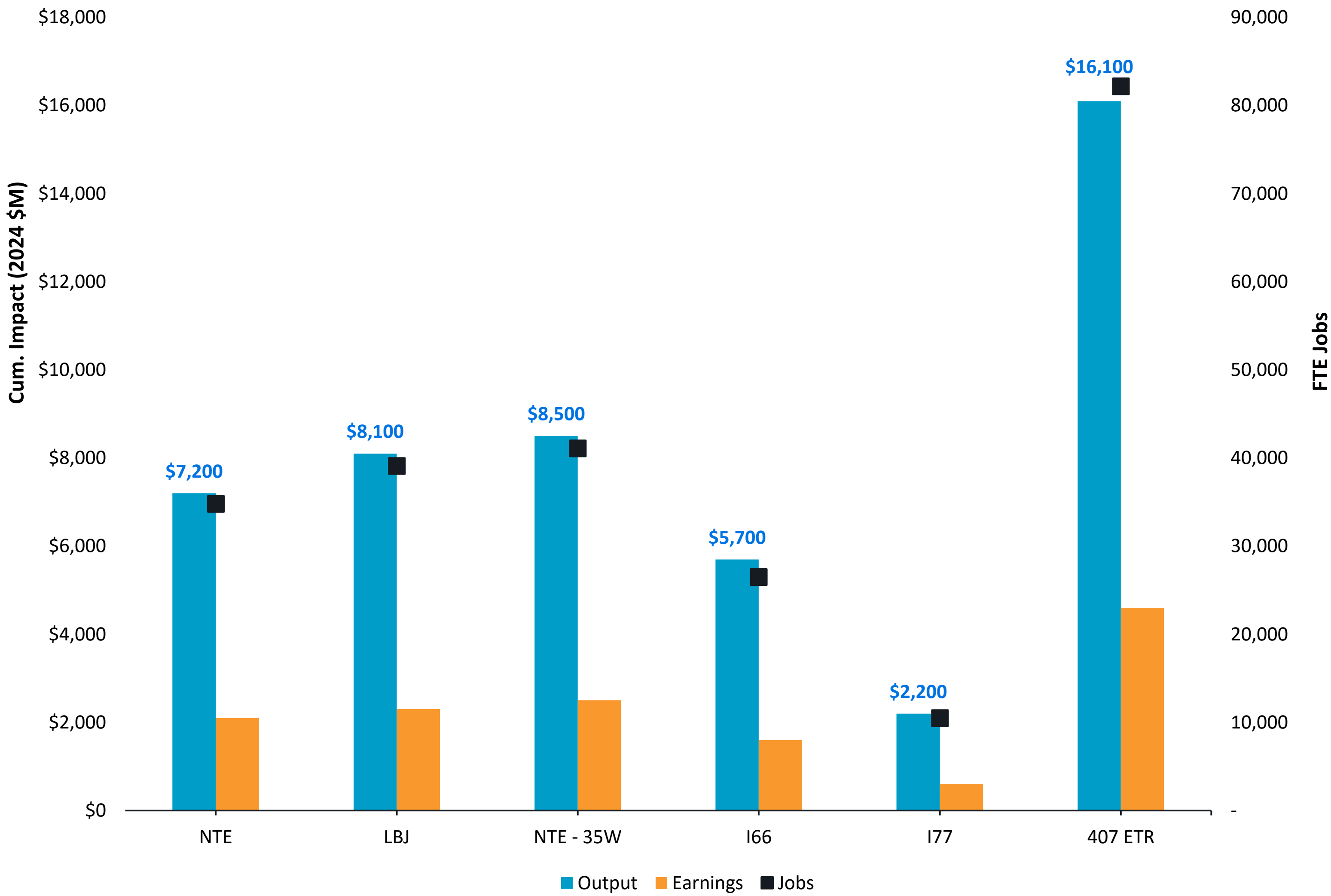
**Table 3.3: Summary of total projected Impacts to Regional Economies for current Cintra assets 2025-2034, 2024 $M**

| | Asset | Location | Years of Impact | Economic output | Earnings | FTE Jobs (job-years) |
|---|---|---|---|---|---|---|
| 1 | NTE | TX, US | 10 | $1,900 | $560 | 9,300 |
| 2 | LBJ | TX, US | 10 | $1,320 | $380 | 6,400 |
| 3 | NTE 35W | TX, US | 10 | $1,400 | $410 | 6,900 |
| 4 | I-66 | VA, US | 10 | $1,090 | $300 | 5,000 |
| 5 | I-77 | NC, US | 10 | $840 | $240 | 4,000 |
| 6 | 407 ETR | ON, Canada | 10 | $4,100 | $1,200 | 21,000 |
| | **Total** | | | **$10,650** | **$3,090** | **52,600** |

**Table 3.4: Summary of average annual Impacts to regional economies for current Cintra assets 2025-2034, 2024 $M**

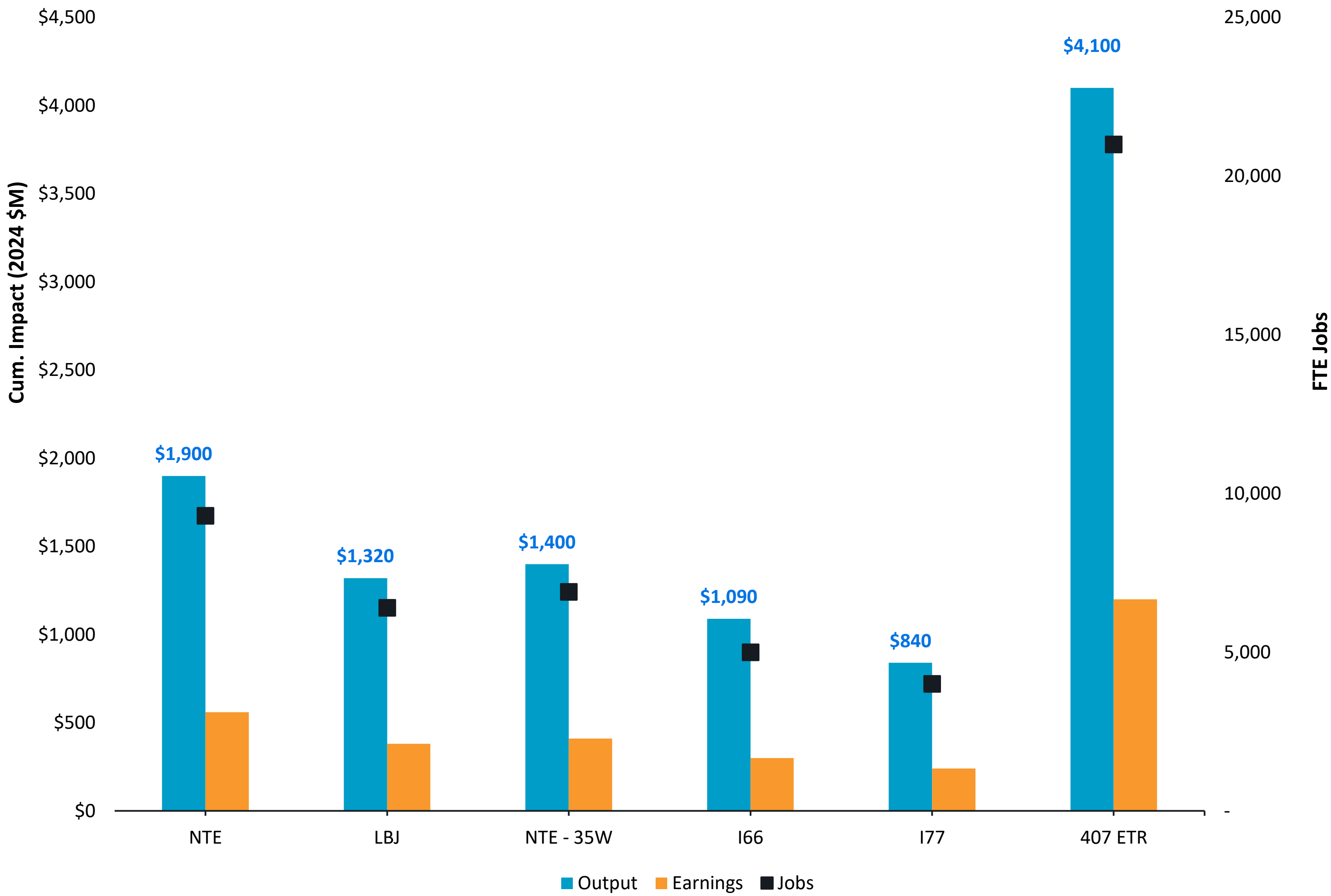
| | Asset | Location | Years of Impact | Economic output | Earnings | FTE Jobs (job-years) |
|---|---|---|---|---|---|---|
| 1 | NTE | TX, US | 10 | $190 | $60 | 930 |
| 2 | LBJ | TX, US | 10 | $130 | $40 | 640 |
| 3 | NTE 35W | TX, US | 10 | $140 | $40 | 690 |
| 4 | I-66 | VA, US | 10 | $110 | $30 | 500 |
| 5 | I-77 | NC, US | 10 | $80 | $20 | 400 |
| 6 | 407 ETR | ON, Canada | 10 | $410 | $120 | 2,100 |
| | **Total** | | | **$1,060** | **$310** | **5,260** |

**Figure 3.1: Summary of total Impacts to Regional Economies for current Cintra assets to 2024 for all assets**




Source: Steer analysis

**Figure 3.2: Summary of total projected Impacts to Regional Economies for current Cintra assets for 2025-2034**




Source: Steer analysis

## 3.3 Impacts to Travelers and Communities

**Table 3.5** and **Figure 3.3** summarize the total Impacts to Travelers and Communities calculated by impact category and type of asset up to 2024. As a total, the assets that are currently in operation in North America have generated a total of $36.4 billion 2024 USD of impacts, where approximately 65% are Traveler Impacts (travel time, trip reliability, and vehicle operating costs). Note that it is not always the case that impacts to communities are positive, as it depends upon the effect of the asset on safety and emissions, both of which can be positive or negative.

**Table 3.6** presents the Impacts to Travelers and Communities as a yearly average per asset.

**Table 3.7** and **Figure 3.4** present the forecast Impacts to Travelers and Communities for the 2025-2034 period. Cintra's road portfolio investment is estimated to produce a total of $36.0 billion 2024 USD of impact, where roughly 53% are Traveler Impacts. This analysis assumes Cintra's continued involvement with and ownership of these assets, which may change between present data and 2034.

**Table 3.8** presents the forecast Impacts to Travelers and Communities for the 2025-2034 period as a yearly average per asset. Overall impacts may vary based on changes in background economic conditions and traveler behavior.

**Table 3.5: Summary of total Impacts to Travelers and Communities to 2024 of current Cintra assets, 2024 $M**

| | Asset | Location | Years of impact | Traveler Impacts | External Impacts | Wider Econ. Impacts | Total |
|---|---|---|---|---|---|---|---|
| 1 | NTE | TX, US | 10 | $3,500 | $2,300 | $590 | $6,390 |
| 2 | LBJ | TX, US | 9 | $1,400 | $2,800 | $240 | $4,440 |
| 3 | NTE35W | TX, US | 7 | $1,700 | $1,500 | $300 | $3,500 |
| 4 | I-66 | VA, US | 2 | $450 | $40 | $80 | $570 |
| 5 | I-77 | NC, US | 6 | $510 | $1,750 | $90 | $2,350 |
| 6 | 407 ETR | Canada | 23 | $16,000 | $200 | $2,900 | $19,100 |
| | | | | **$23,560** | **$8,590** | **$4,200** | **$36,350** |

**Table 3.6: Summary of average yearly Impacts to Travelers and Communities to 2024 of current Cintra assets, 2024 $M**

| | Asset | Location | Years of impact | Traveler Impacts | External Impacts | Wider Econ. Impacts | Total |
|---|---|---|---|---|---|---|---|
| 1 | NTE | TX, US | 10 | $350 | $230 | $60 | $640 |
| 2 | LBJ | TX, US | 9 | $160 | $310 | $30 | $500 |
| 3 | NTE35W | TX, US | 7 | $250 | $210 | $40 | $500 |
| 4 | I-66 | VA, US | 2 | $230 | $20 | $40 | $290 |
| 5 | I-77 | NC, US | 6 | $80 | $290 | $10 | $380 |
| 6 | 407 ETR | Canada | 23 | $700 | $10 | $130 | $840 |
| | Total | | | **$1,770** | **$1,070** | **$310** | **$3,150** |

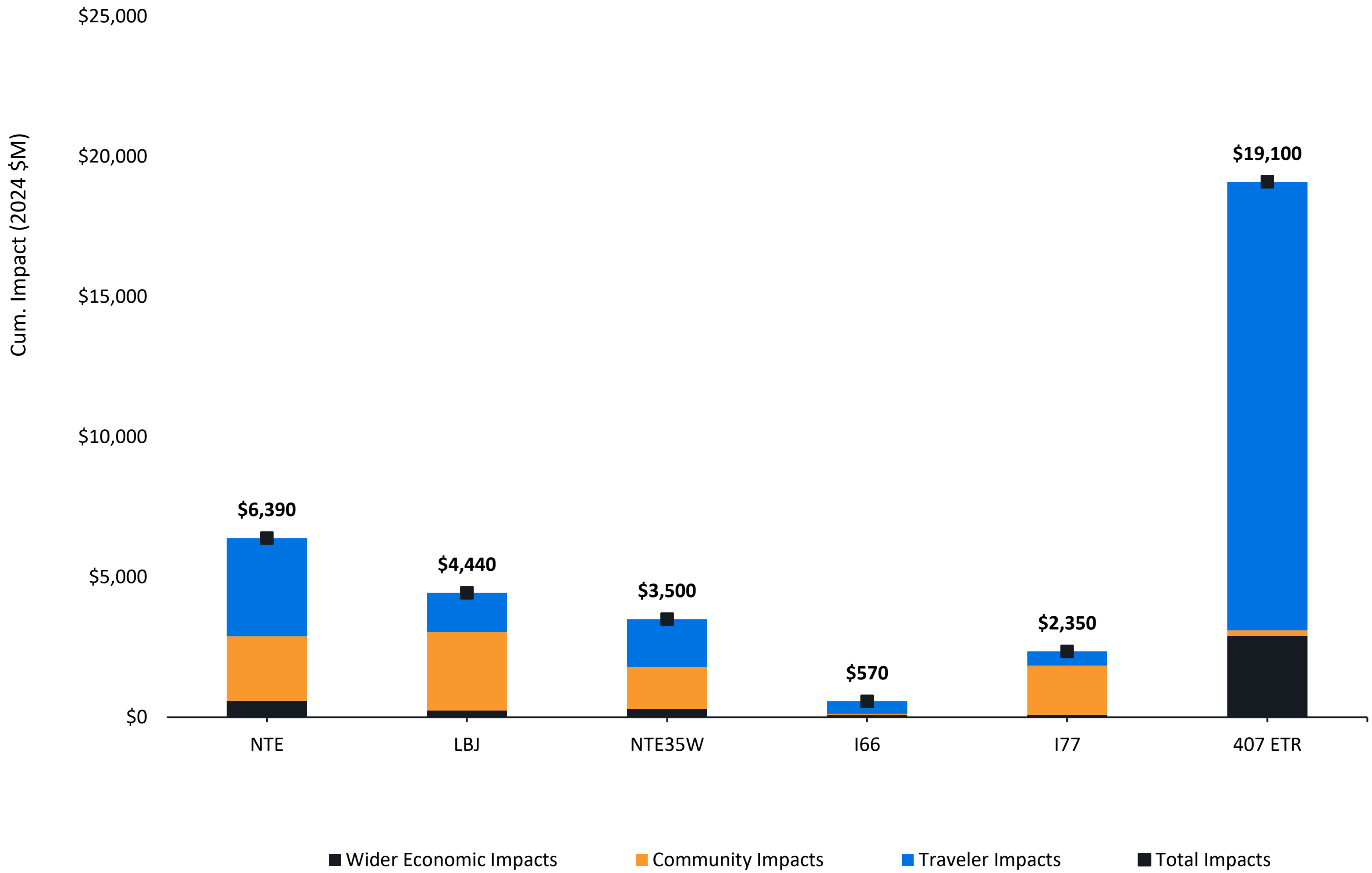
**Table 3.7: Summary of 2025-2034 projected Impacts to Travelers and Communities of current Cintra assets, 2024 $M**

| | Asset | Location | Years of impact | Traveler Impacts | External Impacts | Wider Econ. Impacts | Total |
|---|---|---|---|---|---|---|---|
| 1 | NTE | TX, US | 10 | $3,400 | $2,600 | $580 | $6,580 |
| 2 | LBJ | TX, US | 9 | $900 | $3,700 | $150 | $4,750 |
| 3 | NTE35W | TX, US | 7 | $4,300 | $2,600 | $730 | $7,630 |
| 4 | I-66 | VA, US | 2 | $2,900 | $300 | $490 | $3,690 |
| 5 | I-77 | NC, US | 6 | $1,400 | $4,200 | $230 | $5,830 |
| 6 | 407 ETR | Canada | 23 | $6,400 | $120 | $1,100 | $7,620 |
| | **Total** | | | **$19,300** | **$13,520** | **$3,280** | **$36,100** |

**Table 3.8: Summary of 2025-2034 average annual projected Impacts to Travelers and Communities of current Cintra assets, 2024 $M**

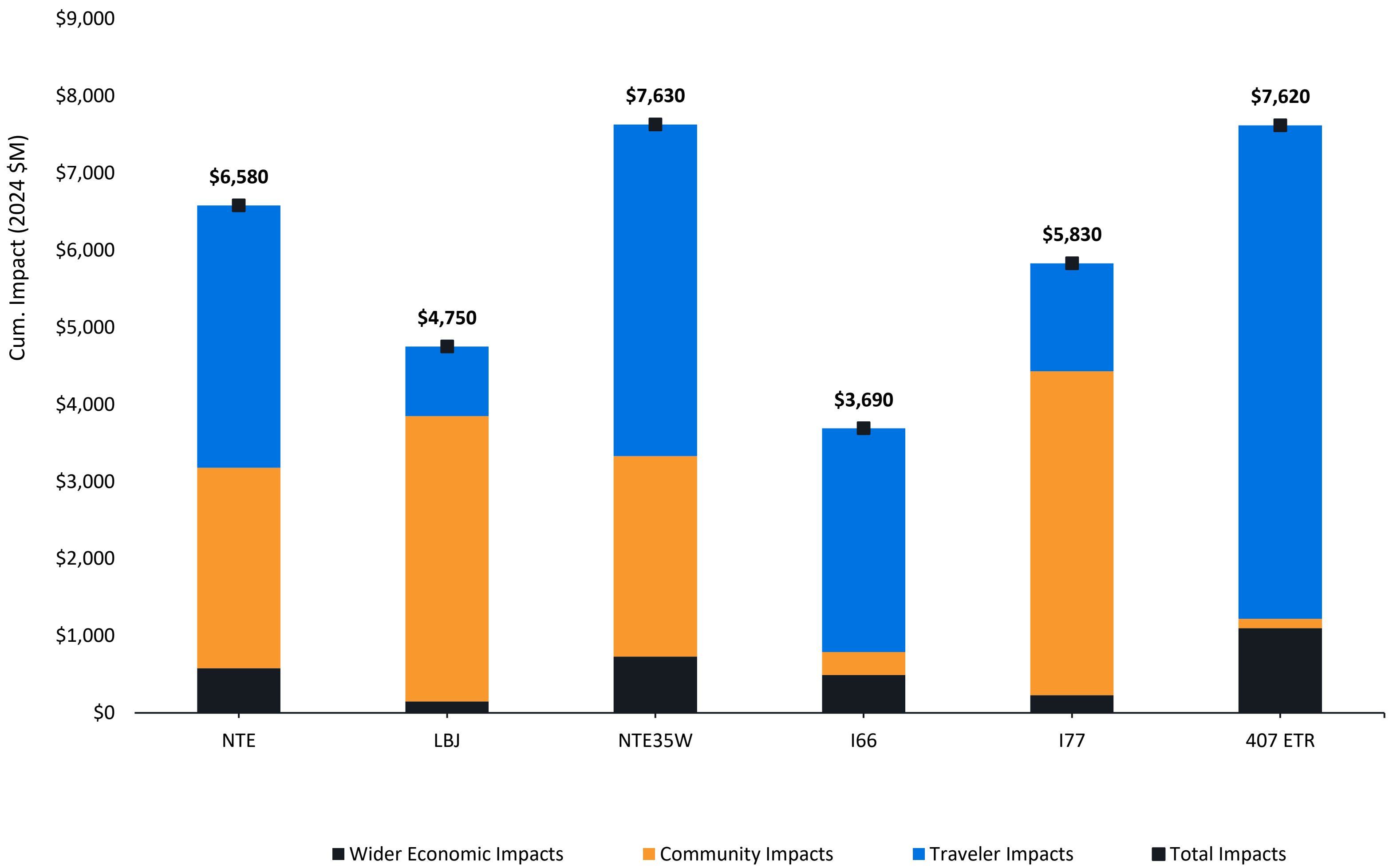
| | Asset | Location | Years of impact | Traveler Impacts | External Impacts | Wider Econ. Impacts | Total |
|---|---|---|---|---|---|---|---|
| 1 | NTE | TX, US | 10 | $340 | $260 | $60 | $660 |
| 2 | LBJ | TX, US | 9 | $90 | $370 | $20 | $480 |
| 3 | NTE35W | TX, US | 7 | $430 | $260 | $70 | $760 |
| 4 | I-66 | VA, US | 2 | $290 | $30 | $50 | $370 |
| 5 | I-77 | NC, US | 6 | $140 | $420 | $20 | $580 |
| 6 | 407 ETR | Canada | 23 | $640 | $10 | $110 | $760 |
| | **Total** | | | **$1,930** | **$1,350** | **$330** | **$3,610** |

**Figure 3.3: Summary of total Impacts to Travelers and Communities of current Cintra assets to 2024**




Source: Steer analysis

**Figure 3.4: Summary of total projected Impacts to Travelers and Communities of current Cintra assets for 2025-2034**




Source: Steer analysis

# 4 Conclusions

## 4.1 Overview

This chapter presents a summary of all impacts estimated in this report – including a restatement of overall impacts across the whole portfolio and by geography.

## 4.2 Overall Impacts

This Study conducted an analysis of Cintra's six North American assets (excluding the two extensions to the 407). Each asset was analyzed with a consistent methodology to determine its Impacts to Travelers and the Community (changes to traveler and community value due to investment in the transportation network) and Impacts to the Regional Economy (outcomes associated with spending on infrastructure).

Estimates for Impact to **Regional Economies** is shown in **Table 4.1**, while **Impact to Travelers and Communities** is shown in **Table 4.2**.

**Table 4.1: Impact to Regional Economies, USD**

| | Estimated Historic Performance | | | Forecast Future Performance (2025-2034) | | |
|---|---|---|---|---|---|---|
| | Economic Output | Salary Earnings | Employment (FTE) | Economic Output | Salary Earnings | Employment (FTE) |
| US | $31,700 | $9,000 | 152,000 | $6,600 | $1,900 | 31,700 |
| Canada | $16,100 | $4,600 | 82,200 | $4,100 | $1,200 | 21,000 |
| **Total** | **$47,800** | **$13,600** | **234,200** | **$10,700** | **$3,100** | **52,700** |

Table 4.1 notes a significant Impact to Regional Economies. An estimated $47.8 billion in economic output has been generated over the asset lifecycle through to year-end 2024. In addition, $13.6 billion in salary earnings were generated by the Cintra's current assets over their lifecycle through to year-end 2024. Over the same period, there have been an estimated 234,200 Full Time Equivalent (FTE) job-years of labor generated to construct and maintain/operate the assets.

Over the 2025-2034 period, an additional $10.7 billion of economic output, $3.1 billion of salary earnings, and an estimated 52,700 Full Time Equivalent (FTE) job-years of labor are forecasted to be generated from the construction and maintenance/operations of the current portfolio.

**Table 4.2: Impacts to Travelers and Communities**

| | Estimated Historic Performance | | | Forecast Future Performance (2025-2034) | | |
|---|---|---|---|---|---|---|
| | Total Impacts | Impacts to Travelers | Impacts to Communities | Total Impacts | Impacts to Travelers | Impacts to Communities |
| US | $17,300 | $7,700 | $9,600 | $28,400 | $12,800 | $15,600 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Canada | $19,100 | $16,000 | $3,100 | $7,600 | $6,400 | $1,200 |
| **Total** | **$36,400** | **$23,700** | **$12,700** | **$36,000** | **$19,200** | **$16,800** |

**Table 4.2** notes a range of Impact to Travelers and Communities **–** including $36.4 billion in value realized to date from Cintra's current assets. This includes $23.7 billion of direct Traveler Impacts (from faster and more reliable travel times), and $12.7 billion in Community Impacts, consisting of $8.5 billion in External Impacts (changes in collisions and emissions), and $4.2 billion in Wider Economic Impacts (reflecting improved productivity due to decreased travel times). The forecasts for the 2025-2034 period notes an estimated additional benefit of $36.0 billion, which is comprised of $19.2 billion of direct Traveler Impacts, and $16.8 billion in Community Impacts, comprised of $13.5 billion in External Impacts and $3.3 billion in Wider Economic Impacts.

*Future results for Impacts to Travelers and Communities and Impacts to Regional Economies may vary from these depending on the assets Cintra includes in its portfolio and broader economic and demographic trends.*

## 4.3 Variations from 2023 Study

### 4.3.1 Cumulative impacts up to 2024

Impacts realized to date increase for all assets relative to the 2023 Study. This reflects an additional two years (2023 and 2024) compared to the prior Study, and the inclusion of impacts to travelers and communities for I-66 for the first time, which opened in 2023. The price base in which impacts are reported has also changed from 2022 to 2024 prices.

### 4.3.2 Cumulative impacts to 2025-2034

Future impacts across the ten-year study horizon are broadly comparable, or greater, than that estimated previously. Changes vary by asset and by impact type, reflecting:

- **Changes in asset usage and traffic** – travel patterns continue to evolve alongside wider macro-economic trends. As a result, volumes and travel speeds are different for some assets compared to the previous analysis, reflecting new traffic data and projections provided by Cintra.
- **Updates to socioeconomic data and parameters –** social and economic parameters have been updated in line with revised data and guidance, including but not limited to:
  - **Revised values-of-time**, with values updated in line with new US Department of Transportation Benefit-Cost Analysis Guidance and 2024 PPP.
  - **Revised emissions parameters**, as discussed in Section 2.5.2, changes in the US Department of Transportation Benefit-Cost Analysis Guidance significantly increase the damage costs associated with pollutant emissions, particularly carbon dioxide. This has led to a significant increase in the negative impacts associated with increased emissions, captured within External Impacts. Emission rates (tons per vehicle-mile) have also been updated with US Bureau of Transportation Statistics data.
  - **Revised safety data and parameters,** underpinned by updated 2023/24 crash rates for each asset provided by Cintra and state accident rates per VMT statistics.

  - **Other economic variables,** which reflect how, as macro-economic changes occur, the value and level of impacts to regional economies can change as well, which has an effect on study results. This includes the updated RIMSII and OECD input-output tables.
- **Inclusion of the 3C expansion of NTE 35W** – opening in 2023, this expansion increased the length of NTE 35W by circa 70%, significantly increasing both travel time savings associated with this asset and the vehicle miles traveled associated with it. Since this expansion was not considered in the prior assessment, future impacts to travelers and communities for NTE 35W are therefore significantly greater than previously estimated.

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