

**BEFORE THE  
SURFACE TRANSPORTATION BOARD**

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**STB DOCKET NO. FD 36873**

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**UNION PACIFIC CORPORATION AND UNION PACIFIC RAILROAD  
COMPANY  
– CONTROL –  
NORFOLK SOUTHERN CORPORATION AND NORFOLK SOUTHERN  
RAILWAY COMPANY**

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**Verified Statement of David T. Hunt**

**April 29, 2026**

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## 1. Qualifications

My name is David T. Hunt. I am a Vice President with Oliver Wyman, a leading general management consulting firm with more than 60 offices in 31 countries. Oliver Wyman maintains one of the largest practices in the world dedicated to the transportation and logistics sectors. Oliver Wyman's transportation clients include national and regional governments on six continents, as well as many of the world's largest users of rail services, railroads, motor carriers, leasing companies, and industrial and consumer manufacturing firms.

I have been a consultant in the transportation sector for more than 40 years. I joined Oliver Wyman in 2008, specializing in strategic planning, regulatory issues, and operations for freight railroads and other freight transportation providers. Prior to joining Oliver Wyman, I was a consultant at Cambridge Systematics, Wilbur Smith Associates, and ALK Associates. While at ALK from 1983 through 2000, I provided services to clients in connection with most Class I railroad mergers that occurred during that period, including BN-ATSF, UP-SP, and CR-CSXT/NS. I also was responsible for the annual calibration of and updates to ALK's Advanced Traffic Diversion Model that was used in ICC and STB merger proceedings. I hold a bachelor's degree in civil engineering from West Virginia University and a master's degree in civil engineering and operations research from Princeton University. My resume is included in Appendix G. My office address is 1 University Square, Suite 100, Princeton, NJ 08540.

## **2. Preliminary Matters and Summary of Findings**

### **2.1. Summary of Changes Since December 2025 Statement**

Along with Matthew Schabas, I sponsored the traffic diversion analysis developed by Oliver Wyman and included in the original Application requesting Board authority for Union Pacific (“UP”) to control Norfolk Southern (“NS”), filed December 19, 2025. This statement presents a revised analysis. The primary revision to the analysis involves improving the precision of the rail traffic data used in the analysis, by replacing data from the Board’s Confidential Carload Waybill Sample (“CCWS”) with 100% traffic data from all Class I railroads. This revised analysis also provides the post-merger market share calculations required by the Board’s Decision No. 9. As discussed in Appendix E, the analysis shows projected increases in UP-NS market shares as a direct result of the merger’s central benefit – creating new single-line service that customers demand – which is expected to generate growth and deliver public benefits through better service, lower costs, and greater reliability.<sup>1</sup>

During the preparation of the diversion analysis filed in December 2025, 100% traffic data was available for only four of the six Class I railroads. With 100% traffic data now available, traffic diversions were updated using 100% traffic data for all six Class I railroads. Charles River Associates (“CRA”) combined the Class I waybill data with the Board’s Confidential Carload Waybill Sample (“CCWS”) for non-Class I movements to create a “100% waybill data” file, which was used as a consistent data source for the rail-to-rail and truck-to-rail analyses<sup>2</sup> (see Appendix F for additional detail).

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<sup>1</sup> I am the sole sponsor of this new statement because Mr. Schabas is accepting a new position in the transportation industry and will be departing from Oliver Wyman.

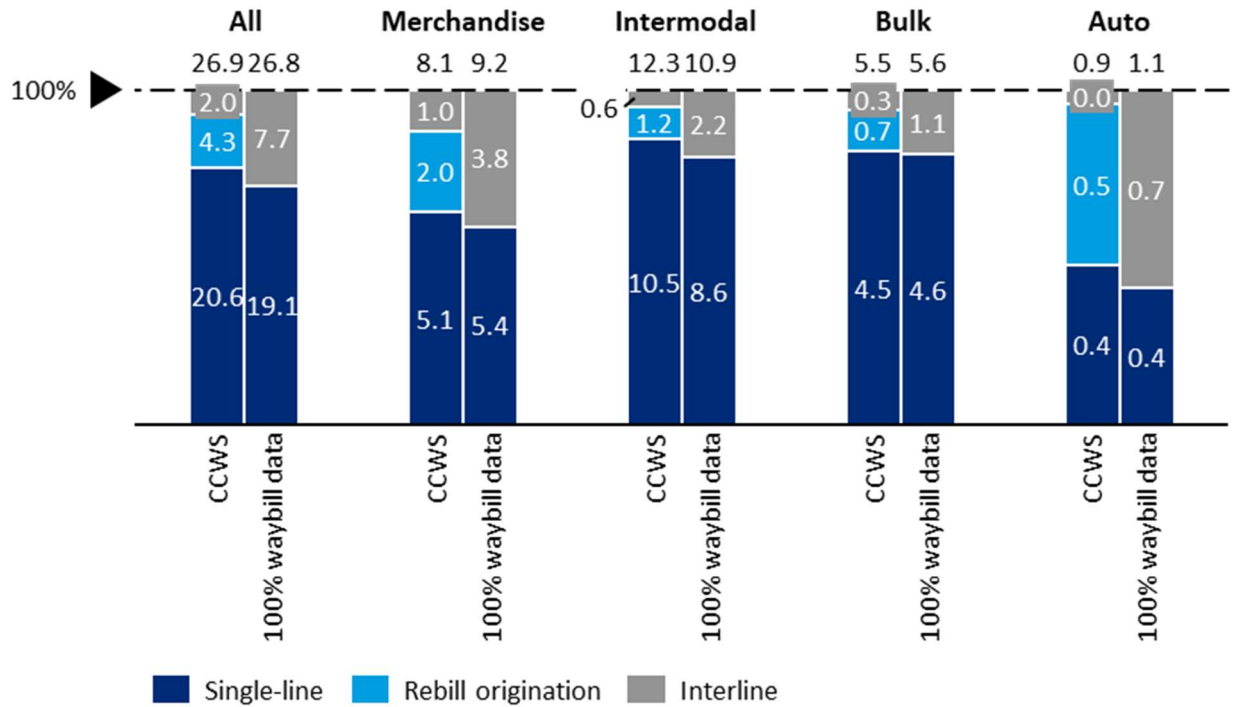
<sup>2</sup> 100% waybill data consists of 2023 traffic records from BNSF, Canadian National (“CN”), CPKC, CSX, Norfolk Southern (“NS”), and Union Pacific (“UP”), plus the 2023 Surface Transportation Board Confidential Carload Waybill Sample (“CCWS”) for non-Class I moves.

By using 100% traffic data for all six Class I railroads, CRA was able to more accurately implement waybill stitching logic to pair waybills that form parts of an interline move, whether reported as an interline move, a Rule 11 rebill, or an interline move that used two unconnected waybills. The third category is particularly important for intermodal, where rubber-tire interchange connections in Chicago, IL are common. Stitching together two unconnected waybills also reduces the total waybill count, by combining two single-line waybills into a single interline waybill.

CRA's more accurate stitching together of waybills that form interline moves significantly increased the share of rail traffic identified as moving interline, as shown in Exhibit 2-1. The largest change was to merchandise: use of 100% traffic data produced an increase of 1.1 million carloads as compared with CCWS data, and an increase of 800,000 interline cars. Stitching together waybills for intermodal – particularly rubber-tire interchanges – also produced a significant increase in the share of interline units and reduced the single-line unit count by approximately 2.1 million intermodal units. Full details are shown in Exhibit F-3 in Appendix F.

**Exhibit 2-1: Comparison of CCWS and 100% waybill data<sup>3</sup>**

Millions of revenue loaded carloads/intermodal units



A second revision to the analysis was to incorporate a tighter integration between rail-to-rail traffic diversions, the routes from which traffic diverted, and the commodity transported. The prior statement took a broader overall market share shift approach to diversions rather than connecting them to specific current-state routes. This revision allowed traffic diversions at a 4-digit STCC level to be more easily linked to the market analysis tables generated by CRA, thus enabling post-merger market shares to be calculated, as required by the Board’s Decision No. 9 (see Appendix E).

Third, using 100% traffic data rather than a sample provided complete accuracy on true origin to true destination traffic by commodity. This changed the mix of traffic by origin-destination lane. Going from a sample to 100% traffic data added more low-volume lanes not captured in the sample, as could be expected, even if aggregate tons and carloads are represented

<sup>3</sup> See workpaper “CRA CCWS Comparison.xlsx.”

in expansion factors. Conversely, some lanes included in the CCWS had a reduction in volume, since they were expanded to represent unsampled lanes. This most impacted diversion projections when the same models were applied was to more heavily fragmented merchandise traffic.

Finally, in revising the analysis, the effects of certain truck traffic records that had been duplicated in the 2023 S&P Global Transearch database used to identify divertible truck movements were corrected. The largest impact was to Miami-Dade County, with smaller impacts to specific counties in Connecticut and the Mexican state of Baja California (see Appendix F).

Although the revised analysis produced changes to estimated diversions in individual origin-destination-commodity lanes and across service types, the bottom-line results of the original and revised analyses are similar. The net diversions after adjusting for extended haul and long-haul drayage offsets increased by 1% based on carloads/units.

## **2.2. Concerns Raised by Canadian National Railway**

Before discussing the diversion modeling and its results, I want to address concerns raised by Canadian National Railway (“CN”) about the integrity of this modeling exercise. I do so at the outset because these issues relate to the proper interpretation of the modeling framework and provide useful context for the discussion that follows.

CN presented one critique of the rail-to-rail diversion model in the original Application that no longer applies to the modeling in the Amended Application – the existence of so-called “phantom carloads.” The use of 100% traffic data and other changes made to facilitate reporting of post-merger market share results at a 4-digit STCC level eliminated so-called “phantom carloads.” I therefore focus on what appears to be CN’s principal remaining contention: that the model understates rail-to-rail diversions.

When creating statistical models to predict outcomes under changed circumstances, it is important to isolate the incremental impacts of the change that is being studied from unobserved and/or unmeasurable factors (i.e., confounding variables). The gold standard is a randomized drug trial, where a control group receives a placebo and a treatment group receives an experimental drug. If the two groups are truly random, then comparing the control and treatment groups isolates the impact of the treatment, while controlling for features like age, underlying health issues, etc.

Models built from observational data cannot rely on randomized trials to control confounding variables. It is not possible, for example, to allow some customers to benefit from a merger but randomly refuse those benefits to others in a control group. It is possible, however, to use a model to create a baseline that functions as the control group and attempts to capture the confounding variables. Comparing the modeled baseline against the modeled results obtained after a single change in condition (such as a merger) isolates the impacts of the change, while minimizing other confounding variables not related to that change. The comparison must be done, however, by taking the difference between the modeled post-merger condition and the modeled baseline, not between the modeled post-merger condition and the historical data used to develop the modeled baseline.

The diversion model and estimates were developed based on observational data. The baseline predicted market shares produced by the model function as the “control group” that accounts for unmeasured market conditions, which can vary across the thousands of railroad marketing personnel and shipper logistics managers making rail transportation decisions. It could be that for a particular service type/lane combination, Railroad A wanted to attract a large customer and offered a reduced rate, even though it did not have the most efficient route. It could

also be that a logistics manager had a bad experience with Railroad B and will only use Railroad C, even though Railroad C does not have the most efficient route. By subtracting the model's pre-merger predicted market shares (i.e., the baseline shares) from the model's post-merger model predicted market shares, the merger's impact can be isolated, ensuring that the model does not conflate confounding factors with merger-related market share gains.

CN's witness states, "In essence, the diversion calculation removes the predicted pre-merger market share from the diversion estimate."<sup>4</sup> That is correct. What CN's witness fails to recognize, however, is that the pre-merger market share estimate is unrelated to the merger, and if one were to add that share to the predicted post-merger market share, the sum would incorrectly overstate the estimated diversions attributable to a UP-NS merger.

I worked with Dr. Orley Ashenfelter, Emeritus Professor of Economics at Princeton University, on the design of the rail-to-rail diversion model in the 1990s. The approach applied here follows standard econometric practice and is consistent with methodologies used in prior proceedings before the Board, including analyses I personally prepared for CN in prior transactions.<sup>5</sup>

Consider a stylized example. On a given lane (origin-destination), assume the traffic diversion model predicts that UP-NS interline service should carry 50 carloads in the pre-merger world, while in reality UP-NS service carries no carloads and all 100 carloads are handled by a BNSF-CSXT interline movement. This divergence between the model and reality is neither surprising nor indicative of a problem: it is an inherent feature of any regression-based framework. The statistical model fits relationships across a large dataset and creates the best,

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<sup>4</sup> Verified Statement of Henry J. Kahwaty, PhD, March 23, 2026, paragraph 34.

<sup>5</sup> STB Finance Docket No. 36500 (Sub-No. 1), Verified Statement of David T. Hunt in Support of Springfield Divestiture to CN, February 28, 2022; STB Finance Docket No. 33556, Verified Statement of George C. Woodward and Michael H. Rogers, July 1998. Woodward and Rogers were at ALK and used the advanced traffic diversion model (ATD), which included the base case I created.

unbiased estimates of the effects of observable variables by minimizing the sum of squared residuals. No model perfectly matches each individual observation. As a result, discrepancies between predicted and actual traffic at the lane level are expected and simply reflect confounding factors; that is, unobserved influences on traffic flows.

The relevant question for a diversion study, however, is not why the model's baseline prediction differs from observed traffic, but rather how the predicted traffic flows change as a result of the merger, holding all else constant.

In the rail-to-rail portion of the diversion study, when the model simulates the merger, it replaces interline service with single-line service for the affected carriers on specific lanes and recomputes predicted traffic. Staying with the example above, suppose the model predicts that UP-NS traffic increases from 50 to 75 carloads as a result of this change. The economically meaningful measure of diversion is therefore 25 carloads – the incremental change attributable solely to the service improvement created by the merger.

CN instead argues that the merger-related diversion should be measured relative to observed pre-merger actual traffic (i.e., from 0 to 75 carloads), implying 75 carloads of diversion. This approach is flawed because it incorporates the model's 50-car difference between predicted and actual pre-merger traffic into the diversion estimate. This reflects baseline confounding factors – not the effects of the merger. Adding the predicted pre-merger market share to the diversion calculation would incorrectly label unexplained pre-merger variations from the baseline as a merger benefit.

In contrast, Oliver Wyman's methodology (which I have used in prior Board merger and acquisition proceedings for decades, including for CN) correctly isolates the causal effect of the merger by focusing exclusively on differences in predicted outcomes between pre- and post-

merger scenarios. This approach holds constant all other factors – observed and unobserved – and attributes changes in traffic solely to the introduction of single-line service.

The methodology refers back to observed actual traffic in only one limited way: to ensure that predicted post-merger traffic does not exceed the total size of the market on a given lane. Specifically, predicted diversions are capped so that total projected UP-NS traffic does not exceed observed total market traffic on a particular lane. This constraint reflects the commonsense principle that diverted traffic cannot exceed the available market volume and is a standard feature of merger diversion analyses, which I have applied in prior proceedings. Importantly, this is the only context in which actual traffic is used in the diversion calculation (other than model calibration), and it serves solely as a bounding condition – not as a basis for measuring diversion itself.

CN raises a second concern regarding those instances in which the model does not assign all traffic on a lane to new single-line service following the merger – particularly for coal movements. CN’s position is that, as a practical matter, customers often prefer to move all traffic between an origin and destination with a single carrier rather than split volumes across competing carriers. From that premise, CN argues that where the model predicts that single-line UP-NS service will attract coal traffic from competitors, UP-NS should be assumed to capture all traffic on that lane.

This assumption would overstate the impacts of the merger. To start, the 100% traffic file shows that less than 6% of all Powder River Basin coal that moves by rail terminates on either CSXT or NS. This means that most Powder River Basin coal moved by BNSF and UP stays in the western US and would be unimpacted by the merger.<sup>6</sup>

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<sup>6</sup> Montana and Wyoming originations of coal terminating on either CSXT or NS. See workpaper “HC-Powder River vFinal.xlsx.”

For coal that does move east, the rail-to-rail diversion model offers a probabilistic estimate of how traffic could reallocate across *all* origins and destinations served by BNSF-NS (or UP-CSXT or BNSF-CSXT) in response to improved single-line UP-NS service offerings. For example, consider a scenario in which the model predicts that approximately 70% of BNSF-NS coal movements from the Powder River Basin would divert to UP-NS single-line service following the merger. It is not a declaration that any particular mine-to-plant movement will shift in full.

If, however, one was to override the model, as CN proposes, by assuming that all traffic on any “diverted” BNSF-NS coal lane would shift entirely to UP-NS single-line service, the result would necessarily exceed the model’s 70% diversion prediction. CN’s approach would discard a data-based, system-wide estimate in favor of an assumption that automatically produces higher diversion numbers. In doing so, it would systematically overstate both the magnitude of projected diversions and the associated benefits of the transaction, rather than reflecting the most likely outcomes supported by the data.

Finally, CN’s witness takes issue with my use of zero traffic routes in calibrating the logistic regression-based diversion model. CN’s proposed approach would ignore potentially significant information and thus make the model less reliable. CN’s witness claims that “Because the statistical model’s explanatory variables...are calibrated for each service type using the zero traffic routes (in addition to historic routes with actual volume in 2023), these calibrations are distorted.”<sup>7</sup> Claiming the calibrations are distorted is incorrect. Including competitive rail routes that, for whatever reason, happened to have zero traffic in a market in the 2023 data is an important component of the calibration. If Railroad A had 100 cars historically and Railroad B

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<sup>7</sup> Verified Statement of Henry J. Kahwaty, Ph.D., March 23, 2026, paragraph 35.

had zero cars for a particular service type/lane combination, excluding the zero-volume route would bias the model by excluding a valid real-world result in developing the pre-merger baseline. The zero-volume routes are meaningful – they all involve competitive, feasible routes as defined in Appendix A.5.

A well-known example of ignoring zero points in a regression involves the O-ring failure that caused the explosion of the space shuttle Challenger in 1986. Prior to the launch, engineers were reviewing a graph of O-ring failures versus the temperature at launch. They detected no relationship when modeling the impact of temperature on O-ring failure. In a report commissioned by then-President Ronald Reagan, the Presidential Commission on the Space Shuttle Challenger Accident reviewed the same information but added the zero-volume points (the temperature at times when the O-rings did not fail).<sup>8</sup> This showed a clear relationship between temperature and O-ring failure, a relationship that would have better estimated the probability of failure on the cold morning that the Challenger was launched.

I realize space shuttle O-rings and freight rail market shares are very different, but I use the example when I consider the risks of excluding potentially meaningful data when developing a predictive model – such as competitive rail routes that happened to not have traffic in a market in a given year.

In sum, CN's criticisms are misplaced. The appropriate measure of rail-to-rail diversion is the model-predicted change in traffic resulting from the merger, holding everything else constant. It is not the difference between predicted post-merger traffic and observed historical traffic. Furthermore, overriding the model's predictions by diverting all coal traffic from one railroad to another and ignoring competitive routes that happen to have no volume would lead to

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<sup>8</sup> Report of the Presidential Commission on the Space Shuttle Challenger Accident, Volume 1, p. 146, Figures 6 and 7.

inaccurate diversion estimates. Taking the steps advocated by CN would undermine the internal logic of the model, produce systematically biased diversions, and overstate the impacts of the merger.

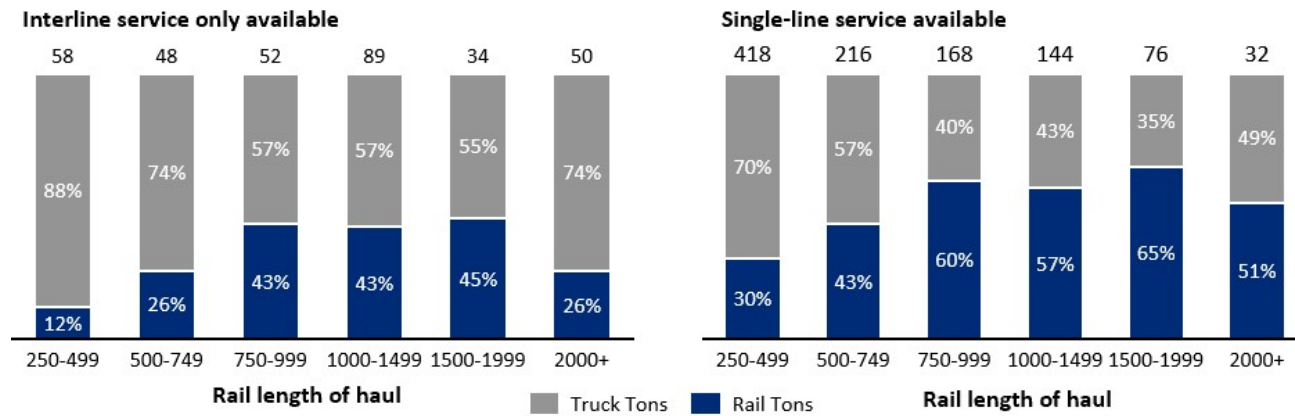
### **2.3. Summary of Key Findings**

UP and NS asked Oliver Wyman to provide an analysis and estimate of potential rail-to-rail and truck-to-rail diversions that could occur as a result of their merger. The companies have reviewed and verified the information used to develop the diversion estimates presented in this Verified Statement. The key findings are:

1. Rail customers prefer single-line service. As shown in Exhibit 2-2, in truck-competitive merchandise/bulk markets, rail's market share is materially greater where single-line service is available than where service is limited to interline routings. The same holds true for intermodal markets. Customers strongly favor single-line service over interline service because of its lower costs, improved reliability, and faster transit times.

**Exhibit 2-2: Rail vs. trucking in merchandise/bulk markets: interline service only vs. single-line service available<sup>9</sup>**

Millions of tons; % rail vs. truck



- Shippers benefit from meaningfully lower pricing on single-line routes, which consistently show lower railroad revenue per ton-mile across distance bands (Exhibit 2-3). In the 1,000 to 1,500-mile range, for example, the price of interline service is 34% higher on average than for single-line service for general merchandise.

<sup>9</sup> Note: Interline service defined as > 1 Class I railroad. Sources: S&P Global 2023 Transearch; 2023 100% waybill data, op. cit;; 2023 STB CCWS, op. cit; see workpaper “HC-Section 2 Exhibits vFinal.xlsx.”

**Exhibit 2-3: Rail revenue per ton-mile: single-line vs. interline service as reported in the CCWS<sup>10</sup>**

|                | General merchandise<br>carloads<br>Service type <sup>11</sup> 1 |              |               | Intermodal units<br>Service type 2 |              |               | Bulk carloads<br>Service type 3 |              |               | Automotive carloads<br>service type 4 |               |               |
|----------------|-----------------------------------------------------------------|--------------|---------------|------------------------------------|--------------|---------------|---------------------------------|--------------|---------------|---------------------------------------|---------------|---------------|
| LOH<br>(miles) | 0-500                                                           | 500-<br>1000 | 1000-<br>1500 | 0-500                              | 500-<br>1000 | 1000-<br>1500 | 0-500                           | 500-<br>1000 | 1000-<br>1500 | 0-500                                 | 500-<br>1000  | 1000-<br>1500 |
| Single-line    | 0.090                                                           | 0.061        | 0.048         | 0.128                              | 0.082        | 0.079         | 0.076                           | 0.037        | 0.023         | 0.468                                 | 0.237         | 0.196         |
| Interline      | 0.113                                                           | 0.077        | 0.065         | 0.127                              | 0.096        | 0.108         | 0.082                           | 0.047        | 0.027         | 0.785                                 | 0.232         | 0.205         |
| Difference     | <b>0.023</b>                                                    | <b>0.016</b> | <b>0.017</b>  | <b>0.000</b>                       | <b>0.015</b> | <b>0.029</b>  | <b>0.007</b>                    | <b>0.009</b> | <b>0.004</b>  | <b>0.318</b>                          | <b>-0.005</b> | <b>0.010</b>  |
| Percent diff.  | <b>25%</b>                                                      | <b>26%</b>   | <b>34%</b>    | <b>0%</b>                          | <b>18%</b>   | <b>37%</b>    | <b>9%</b>                       | <b>26%</b>   | <b>19%</b>    | <b>68%</b>                            | <b>2%</b>     | <b>5%</b>     |

3. By offering the single-line rail service customers prefer, a merged UP-NS would divert an estimated 402,000 rail carloads and 1.53 million intermodal units annually, totaling 1.93 million loads (Exhibit 2-4). Of these, 467,000 are diversions from existing rail traffic either partly (349,000) or wholly (118,000) using other railroads, 1.2 million are diversions from intermodal traffic currently moving by truck, 191,000 are diversions from merchandise traffic currently moving by truck, and 70,000 are extensions of intermodal moves draying over 250 miles. This growth opportunity represents an increase of 13% over combined UP-NS 2023 base year traffic.<sup>12</sup>

<sup>10</sup> Totals and subtotals on tables may not sum due to rounding. Source: 2023 STB CCWS, op. cit. See workpaper “HC-Section 2 Exhibits vFinal.xlsx.” The CCWS provides a comprehensive and consistent basis to calculate national averages. CRA stated in the 100% data, due to unique data limitations in the waybill data, revenues for other railroads for interlined movements are often unobserved. As a result, revenue-based analyses from the 100% data are likely to be less reliable.

<sup>11</sup> “Service type” refers to the STB classification of rail traffic based on shared commodity characteristics and equipment requirements. For the purposes of this Verified Statement, the service types referenced are general merchandise (“merch”), intermodal, bulk, and automotive (“auto”).

<sup>12</sup> See workpaper “FCS by Commodity 2023 Totals and by RR.xlsx” for combined UP-NS 2023 traffic.

**Exhibit 2-4: Estimated total annual diversions from a UP-NS merger<sup>13</sup>**

Thousands of carloads/intermodal units

|                                                  | Merchandise | Intermodal   | Bulk <sup>14</sup> | Automotive | Total        |
|--------------------------------------------------|-------------|--------------|--------------------|------------|--------------|
| A. Total rail-to-rail diversions                 | 123         | 261          | 31                 | 53         | 467          |
| <i>A1. Rail-to-rail extended haul diversions</i> | <i>97</i>   | <i>181</i>   | <i>28</i>          | <i>43</i>  | <i>349</i>   |
| <i>A2. Rail-to-rail new traffic</i>              | <i>25</i>   | <i>79</i>    | <i>3</i>           | <i>10</i>  | <i>118</i>   |
| B. Total truck-to-rail diversions                | 191         | 1,201        | 0                  | 5          | 1,397        |
| C. Long-haul drayage diversions                  | 0           | 70           | 0                  | 0          | 70           |
| <b>D. Total gross diversions</b>                 | <b>314</b>  | <b>1,532</b> | <b>31</b>          | <b>58</b>  | <b>1,934</b> |
| E. Rail-to-rail extended haul offsets            | -84         | -181         | -34                | -32        | -332         |
| F. Long-haul drayage offsets                     | 0           | -70          | 0                  | 0          | -70          |
| <b>G. Net diversions</b>                         | <b>230</b>  | <b>1,280</b> | <b>(4)</b>         | <b>26</b>  | <b>1,532</b> |

4. As freight shifts off highways and onto single-line rail service, expanded access to these more efficient routes would generate substantial, measurable cost savings for US shippers – approximately \$3.5 billion annually. This reflects a straightforward economic shift: freight that is currently moving by higher-cost truck service would instead move by lower-cost rail, where service becomes more seamless and competitive. On a gross basis, these truck-to-rail diversions would reduce shipper spending on long-haul trucking by an estimated \$7.2 billion per year. Shippers would incur approximately \$3.7 billion in replacement costs for rail linehaul and associated first- and last-mile trucking (drayage), yielding a net reduction of \$3.5 billion in total transportation expenses.

These estimates are grounded in observed market rates for trucking and rail, applied to shipment flows that are expected to divert under expanded single-line service conditions.

From a practical standpoint, this finding reflects a common-sense outcome: when shippers

<sup>13</sup> See workpaper “HC-Section 2 Exhibits vFinal.xlsx.” Note: A1. Rail-to-rail extended haul diversions is the granular output of the model (many small O&Ds) for merchandise, bulk, and automotive. E. Rail-to-rail extended haul offsets is calculated from representative lanes to fully offset car-miles (rather than number of waybills) in the compressed traffic dataset for merchandise, bulk, and automotive (see Appendix C).

<sup>14</sup> Bulk offsets include the conversion of specific merchandise extended haul rail-to-rail diversions of ethanol that move in unit trains. These are modeled in the Operating Plan as unit trains for diversions and the corresponding offset is hence considered “bulk” for the purpose of this table.

are given access to more efficient, end-to-end rail options that avoid costly interchanges, they shift volume from truck to rail and realize significant cost savings – even after accounting for the additional handling required at the beginning and end of intermodal moves. These savings are described further in Section 8.2.

5. Underlying these savings is the introduction of new, truck-competitive intermodal services that expand where rail can effectively compete. A combined UP-NS would launch new intermodal train services with truck-competitive transit times in several lanes and enable new rail services in other lanes via Chicago, IL (e.g., Los Angeles, CA – Boston, MA) that eliminate costly drayage interchanges. There are eight key lanes that would experience a high share of intermodal growth as part of the projected 1.53 million intermodal unit shift to new UP-NS single-line service. They are:

- Southern California – Southeast (Georgia, North Carolina, Florida)
- Southern California – Northeast (Pennsylvania and New York-New Jersey)
- Southern California – Midwest and Ohio Valley
- Texas – Midwest/Ohio Valley
- Northern California – Northeast
- Northern California – Southeast/Ohio Valley
- South Texas – Northeast
- South Texas –Southeast

6. The benefits of expanded single-line service extend beyond intermodal shippers to include merchandise and bulk freight moving in key regional markets. In particular, watershed markets stand to gain as merchandise and bulk freight shifts from truck to rail carload. The “watershed region” is defined as any county within 250 miles of four gateway cities:

Chicago, IL; St. Louis, MO; Memphis, TN; and New Orleans, LA. More than 50% of projected merchandise/bulk diversions from trucks are attributable to creating integrated single-line service to, from, and within the watershed region.<sup>15</sup>

7. Multiple shipper segments would realize substantial benefits from improved single-line service. These include:
  - Chemical and petroleum manufacturers, especially those located in Texas and Louisiana and shipping to New Jersey, Ohio, Pennsylvania, and other eastern states;
  - Food product producers located in Iowa, Nebraska, Minnesota, and other western food-producing regions shipping products east;
  - Retailers and shippers of consumer products with national supply chains, due to new truck-competitive intermodal services that bypass Chicago interchanges, and new lanes from South Texas to the Southeast and Northeast; and
  - Finished vehicle manufacturers, especially from Michigan and Indiana, moving vehicles to California and Texas.
8. By moving large volumes of long-haul freight off highways and onto rail, the merger would improve roadway safety and reduce wear on public infrastructure. The analysis projects a major reduction in long-haul truck traffic on key interstate highway corridors as freight converts to rail under the merger. As shown in Exhibit 2-5, an estimated 2.13 million equivalent truckloads, excluding new local drayage to serve intermodal diversions, are projected to convert from roadways to rail annually due to the merger. The truckloads diverted to rail equate to 3.6 billion truck-miles and are long-haul, with an average haul of approximately 1,696 miles.

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<sup>15</sup> Intra- (10%) and inter-watershed (47%) lanes. Watershed lane types defined in Appendix B.5.3.

**Exhibit 2-5: Estimated total truckloads and truck-miles removed from roadways<sup>16</sup>**

Excludes new local drayage mileage for intermodal diversions

| Service type               | Truckloads<br>(thousands) | Truck-miles<br>(millions) | Avg. miles per unit |
|----------------------------|---------------------------|---------------------------|---------------------|
| Intermodal                 | 1,201                     | 2,484                     | 2,069               |
| Long-haul drayage          | 70                        | 19                        | 265                 |
| <i>Intermodal subtotal</i> | <i>1,271</i>              | <i>2,503</i>              | <i>1,969</i>        |
| Merchandise                | 850                       | 1,092                     | 1,287               |
| Auto                       | 7                         | 14                        | 1,890               |
| <b>Total</b>               | <b>2,128</b>              | <b>3,609</b>              | <b>1,696</b>        |

**Exhibit 2-6: Density map of estimated truckloads diverted from roads due to a UP-NS merger<sup>17</sup>**

All highway lanes with at least 1,000 annual truckloads diverted in at least one direction



<sup>16</sup> See workpaper “C-Trucks Diverted from Highway vFinal.xlsx.” The 2.13 million truckloads result in 1.4 million rail carloads and intermodal units (Exhibit 2-4). Trucks to intermodal units are one-to-one conversions, while trucks to rail carloads account for the ability of a railcar to haul more tons than a truck. Full conversion details explained in Appendix B.12.

<sup>17</sup> Based on county origin–destination pairs, using TransCAD’s all-or-nothing assignment. Some links may appear spatially disjointed from the larger network when the minimum threshold is applied. See workpaper “C-Trucks Diverted from Highway vFinal.xlsx”; see Appendix B.12 for converting truckloads to carloads/intermodal units. Map created using TransCAD Transportation Planning Software and Oliver Wyman diversion analysis data.

9. Following full implementation of the merger, diverted traffic is estimated to generate \$4.03 billion in new revenue annually for UP-NS, which represents an 11% increase over UP and NS combined 2023 operating revenue of \$36.28 billion.<sup>18</sup> Revenue estimates are inclusive of fuel surcharges. Revenue calculation details are provided in Appendix C-2.

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<sup>18</sup> Analysis of Class I Railroads, 2023, Line 1, Total Operating Revenue, Association of American Railroads.

### 3. Basis for Truck-To-Rail and Rail-to-Rail Diversion Models

Shippers selecting freight modes and carriers consider numerous factors in their decision-making. Shippers, however, consistently report three factors as particularly important: price, reliability, and transit time. The Organization for Economic Co-operation and Development (“OECD”) confirmed this in a recent study:

“A huge number of studies deal with the criteria that shippers or their intermediaries – like freight forwarders – take into account when choosing their transport mode. Independently of who has conducted the studies, costs, transit time, and reliability have been found to play the most important role in transport mode choice.”<sup>19</sup>

Oliver Wyman’s diversion models estimate how much traffic would shift to a single-line UP-NS system by focusing on the factors shippers value most: price, reliability, and transit time. **Section 3.1** shows that single-line service captures significantly more market share than interline service in both truck-versus-rail and rail-versus-rail markets, because single-line service better aligns with these preferences. **Sections 3.2 through 3.4** explain how single-line operations improve each factor relative to interline service. **Section 3.5** summarizes the two diversion models: the truck-to-rail model, which groups lanes by price and transit-time competitiveness and uses the number of junctions as a proxy for reliability, and the rail-to-rail logit model, which evaluates route choice based on rail-miles, junction impedance, and the number of interchanges.

#### 3.1. The Impact of Interchanges on Rail Market Share

Rail’s competitiveness with trucking is materially stronger where single-line rail service is available rather than only interline service.<sup>20</sup> As shown in Exhibits 3-1 and 3-2, rail market share

<sup>19</sup> “Mode Choice in Freight Transport,” Research Report, International Transport Forum, OECD, 2022, pp. 7-14.

<sup>20</sup> A “market” is defined by an origin, destination, and commodity. The commodity may be general, such as merchandise/bulk or intermodal, or may be a specific STCC. Merchandise and bulk shipments are combined into one category, since it is unlikely that entire unit trains of bulk commodities (such as grain) would be diverted, especially from truck to rail.

is substantially higher at every length of haul where single-line service is available, both for merchandise/bulk and intermodal traffic, demonstrating the significant competitive advantage such service provides.

Where interline is the only option for merchandise/bulk traffic, market share is 15 to 26 percentage points lower than in lanes where single-line service is available in the same length of haul bands. For example, for merchandise and bulk shipments, rail captures 43% of tons in 750- to 999-mile markets where only interline service is available but 60% if single-line service is available. This 17 percentage point improvement in market share for single-line service is equivalent to approximately 570,000 fewer truckloads annually on the highway.<sup>21</sup>

The preference for single-line for domestic intermodal traffic is similar: single-line rail shares are 15 to 22 percentage points higher than for interline moves. The preference for single-line service is due to the additional transit time and variability involved in executing a steel-wheel interchange, or the additional cost of rubber-tire crosstown drayage. These transit time and cost penalties make it more difficult, particularly at short lengths of haul on either side of the watershed, for interline intermodal service to offer a competitive product to truck. The prevalence of long-haul drayage from Chicago to the Detroit-Toledo region and from Memphis to northern Alabama, with over 170,000 drayage moves per year, illustrates how shippers prefer an expensive drayage move over interline rail service.<sup>22</sup>

In existing domestic intermodal markets with a length of haul over 2,000 miles, interline-only rail has a 45% share compared to truck, while single-line rail has a 67% market share. This 22 percentage point improvement in share for single-line service is equivalent to approximately

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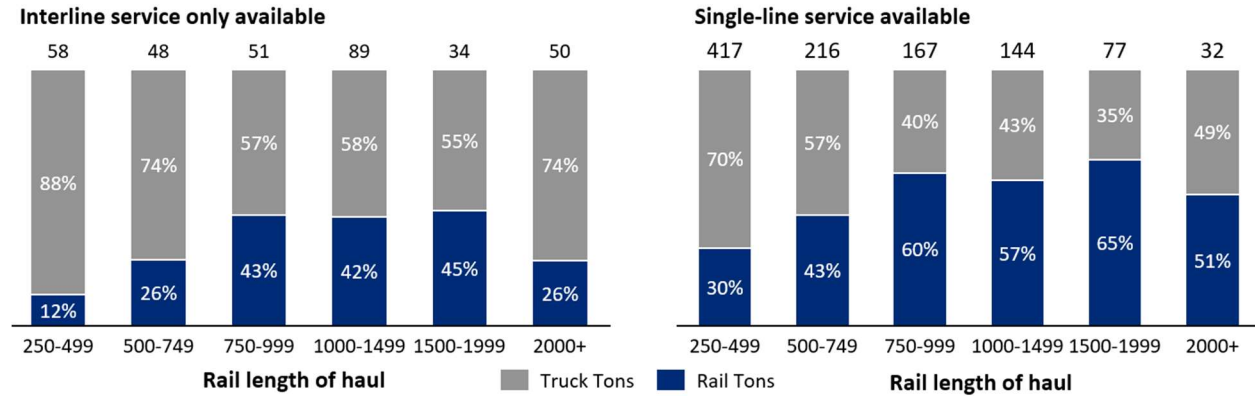
<sup>21</sup> A 17 percentage point share difference in the 750-999-mile distance band has approximately 11 million tons of merchandise traffic. At 20 tons per truck, this is approximately 570,000 annual truckloads.

<sup>22</sup> See Section 5.5.

408,000 fewer truckloads annually on the highway.<sup>23</sup> This only considers where domestic intermodal lanes are available today (interline and single-line) and does not consider corridors which could be offered based on the existing domestic intermodal terminal footprint.

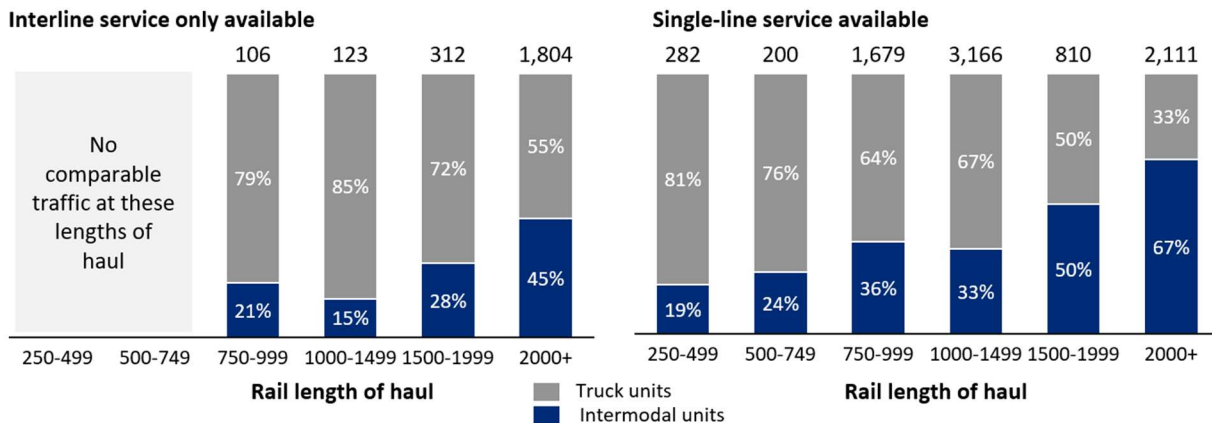
**Exhibit 3-1: Rail vs. trucking in merchandise/bulk markets: interline service only vs. single-line service available<sup>24</sup>**

Millions of tons; % rail vs. truck



**Exhibit 3-2: Rail vs. trucking in domestic intermodal markets: interline service only vs. single-line service available<sup>25</sup>**

Thousands of truckloads/intermodal units; % rail vs. truck



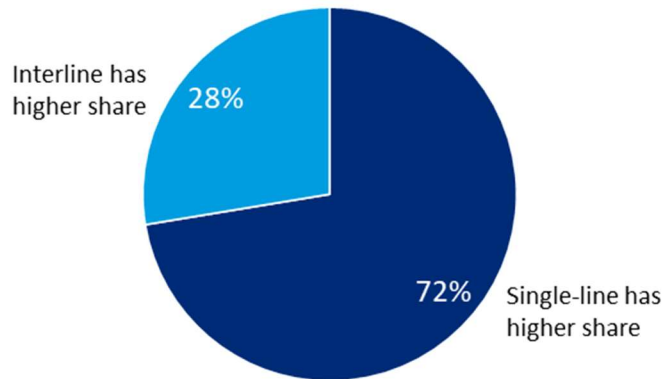
<sup>23</sup> The 2,000+-mile lanes with domestic intermodal traffic have 1.85 million annual truckloads. A 22 percentage point share difference is approximately 408,000 annual truckloads.

<sup>24</sup> Transearch, S&P Global Markets, 2023; 100% waybill data, op. cit., includes “competitive” county-county lanes where both truck and rail compete. Interline service defined as a route requiring two or more Class 1; see workpaper “C-Section 3 Exhibits vFinal.xlsx.”

<sup>25</sup> Transearch, op. cit.; 100% waybill data includes “competitive” domestic intermodal terminal catchment-terminal catchment lanes where both truck and rail compete, intermodal volume clears a minimum density threshold, and current truck traffic is greater than zero; see workpaper “HC-Intermodal Diversions Model vFinal.xlsx.”

Shippers’ strong preference for single-line service also is revealed in markets where single-line and interline rail service compete directly, as single-line service has a higher share of traffic 72% of the time (Exhibit 3-3).

**Exhibit 3-3: Rail single-line vs. interline service market share**<sup>26</sup>  
Number of markets with the same origin, destination, and commodity



Finally, the difference in rail versus truck share is stark when comparing markets that currently have single-line service with markets where a merged UP-NS would introduce new single-line service.

As shown in Exhibit 3-4, current single-line service lanes on average have higher market shares compared to truck than lanes where UP-NS will introduce single-line service with reduced mileage and reduced interchanges. The largest difference is in bulk trucking, where single-line rail has a 58% share, versus a 17% rail share for lanes that are currently interline but would have future single-line UP-NS service. Bulk commodities are well suited to rail, and there are medium- and long-haul truck moves of grain, aggregates, and other bulk commodities in Transearch that could divert to new single-line rail service. Dry van, reefer, and tank truck traffic all show a similar pattern: existing single-line lanes have higher rail shares than lanes where UP-

<sup>26</sup> 2023 traffic base of record (see Appendix A.2); 100% Waybill data, op. cit. selected markets where the minimum JF = 0 and the average JF > 0. Market defined as origin SPLC, destination SPLC, and 7-digit STCC; see workpaper “C-Section 3 Exhibits vFinal.xlsx.” Includes Class I, regional, and shortline railroads to define single-line versus interline.

NS would improve service. Flatbed traffic shows a slightly higher share in interline lanes that would be improved than in current single-line lanes (20% and 18%, respectively) but there are lanes where UP-NS would introduce new single-line rail service that fall below this 18-20% rail share range.

**Exhibit 3-4: Pre-merger comparison of truck/rail share for (a) markets that currently have single-line rail service and (b) markets where UP-NS would improve service<sup>27</sup>**

Merchandise/bulk traffic; millions of tons

|                                   | (a) Truck/rail competitive lanes with single-line rail service (pre-merger shares) |           |            | (b) Truck/rail competitive lanes where UP-NS would improve service (pre-merger shares) |           |            |
|-----------------------------------|------------------------------------------------------------------------------------|-----------|------------|----------------------------------------------------------------------------------------|-----------|------------|
| Alternative to rail by truck type | Truck tons                                                                         | Rail tons | Rail share | Truck tons                                                                             | Rail tons | Rail share |
| Bulk                              | 116.9                                                                              | 161.2     | 58%        | 13.9                                                                                   | 2.8       | 17%        |
| Dry van                           | 258.6                                                                              | 130.1     | 33%        | 22.5                                                                                   | 7.8       | 26%        |
| Flatbed                           | 70.9                                                                               | 15.6      | 18%        | 7.3                                                                                    | 1.8       | 20%        |
| Reefer                            | 17.7                                                                               | 8.0       | 31%        | 3.4                                                                                    | 1.2       | 26%        |
| Tank                              | 56.2                                                                               | 103.2     | 65%        | 13.3                                                                                   | 13.7      | 51%        |

### 3.2. The Impact of Interchanges on Rail Price

A factor in why shippers choose single-line rail service rather than interline when both are realistic options for a shipment is that single-line service is consistently priced lower on a revenue per ton-mile basis, across all lengths of haul (Exhibit 3-5). For example, revenue per ton-mile for general merchandise traffic moving 1,000 to 1,500 miles is on average 34% higher for interline moves than for single-line service in the same distance band.

<sup>27</sup> Transearch, op. cit.; 100% Waybill data, op. cit.; see workpapers “t2merch\_watershed\_summary\_2026\_vFinal.ipynb” and “C-Section 3 Exhibits vFinal.xlsx.” Note: Transearch also includes truck types for hauling livestock and wet cement, which were not considered since these are not commodities moved by railroads. Includes Class I, regional, and shortline railroads to define single-line versus interline.

**Exhibit 3-5: Rail revenue per ton-mile: single-line vs. interline service<sup>28</sup>**

|                | General merchandise<br>Service type 1 |              |               | Intermodal<br>Service type 2 |              |               | Bulk<br>Service type 3 |              |               | Automotive<br>Service type 4 |               |               |
|----------------|---------------------------------------|--------------|---------------|------------------------------|--------------|---------------|------------------------|--------------|---------------|------------------------------|---------------|---------------|
| LOH<br>(miles) | 0-500                                 | 500-<br>1000 | 1000-<br>1500 | 0-500                        | 500-<br>1000 | 1000-<br>1500 | 0-500                  | 500-<br>1000 | 1000-<br>1500 | 0-500                        | 500-<br>1000  | 1000-<br>1500 |
| Single-line    | 0.090                                 | 0.061        | 0.048         | 0.128                        | 0.082        | 0.079         | 0.076                  | 0.037        | 0.023         | 0.468                        | 0.237         | 0.196         |
| Interline      | 0.113                                 | 0.077        | 0.065         | 0.127                        | 0.096        | 0.108         | 0.082                  | 0.047        | 0.027         | 0.785                        | 0.232         | 0.205         |
| Difference     | <b>0.023</b>                          | <b>0.016</b> | <b>0.017</b>  | <b>0.000</b>                 | <b>0.015</b> | <b>0.029</b>  | <b>0.007</b>           | <b>0.009</b> | <b>0.004</b>  | <b>0.318</b>                 | <b>-0.005</b> | <b>0.010</b>  |

### 3.3. The Impact of Interchanges on Rail Reliability

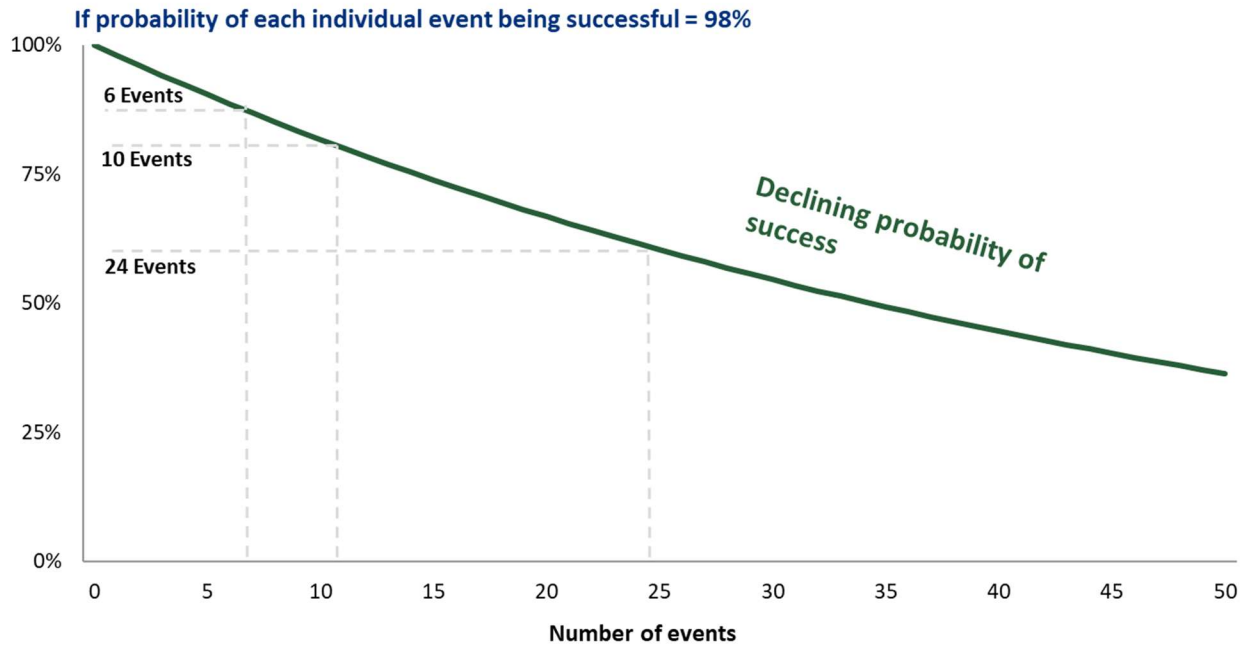
Reliability is crucial for shippers, since uncertain and late delivery times can disrupt operations and create the need for additional inventory levels. For example, a chemicals manufacturer faced with delayed input shipments could incur a costly disruption to operations if it runs out of necessary feedstock for a process, while an automobile assembly plant might have to stop an assembly line if a critical part arrives late.

It is not possible to include a direct measure of reliability by market in the traffic diversion models, since this data does not exist on a lane-by-lane basis nationally. But the impact of reliability can be considered indirectly by looking at junction frequency (i.e., the number of rail interchanges) as a proxy. Simply put, the more interchanges, the greater the risk that a railroad will not be able to meet its service handoff plan for a railcar. And even if the risk of failure for an individual event is small, the overall risk of failure increases as more events are added to a railcar move, as shown in Exhibit 3-6.<sup>29</sup> The result is that single-line service typically will be more reliable than interline service.

<sup>28</sup> Confidential Carload Waybill Sample, op. cit. Single-line defined as junction frequency=0 and rebill flag=0. Interline defined as junction frequency>0 and rebill flag=0. Includes Class I, regional, and shortline railroads to define single-line versus interline. See workpaper “C-Section 3 Exhibits vFinal.xlsx.”

<sup>29</sup> This adverse effect of interchanges on service reliability was established in the 1970s by the Massachusetts Institute of Technology, under funding from the US Department of Transportation Freight Car Utilization Program.

**Exhibit 3-6: The probability of successfully executing a railcar trip plan decreases as the number of switch events increases<sup>30</sup>**



### 3.4. The Impact of Interchanges on Rail Transit Time

Transit time is another important consideration for shippers in managing freight movements to support their supply chains. One reason is that more time spent in transit increases inventory costs and represents a lost opportunity for that shipment to be used or sold sooner.

Shippers do not expect railroads to be faster than trucks but are more likely to switch from truck to rail if railroads can narrow the gap, while improving reliability and remaining below the cost of truck. And interchanges between railroads in interline service add significant transit time.

Using railroad performance data reported to the Board, the average system terminal dwell time of 22 hours (excluding cars on run-through trains) provides a good approximation for the

<sup>30</sup> Note: A 98% probability of performing each individual switching event according to plan is above levels normally experienced by the Class I railroads. The probability of meeting a trip plan is equal to the probability of performing each individual switching event according to plan, raised to the power of the number of switching events. Sources: Testimony of William J. Rennie: Before the STB in the Matter of Ex Parte No. 711, Petition for Rulemaking to Adopt Revised Competitive Switching Rules, March 25, 2014, handout, p. 7; “Freight Car Utilization and Railroad Reliability: Conclusions and Recommendations,” The Industry Task Force on Reliability Studies, October 1977, Final Report.

time a railcar or container spends at each interchange<sup>31</sup>. Even at large gateways, most railcars must be handled twice (at the originating and terminating railroads' terminals) before continuing. A single railroad can perform the same move with just one handling, saving an intermediate handling and the time associated with it.

The issue of interchange time is most acute for intermodal, which is the most time-sensitive rail service product. Some interline lanes offered through Chicago, IL require containers to be drayed between railroad terminals, typically adding a day to transit time. Shippers so dislike extended transit times due to interchange that, for example, they will dray containers over 250 miles east from Chicago, IL and Memphis, TN instead of using interline rail service (see discussion in Section 5.5).

For example, for the approximately 700-mile trip from Minneapolis, MN to Columbus, OH, a two-carrier merchandise rail move would take an estimated 130 hours to complete. A single-line move can reduce that by 17%, to 108 hours; still higher than but more competitive with the transit time for trucks (see Exhibit B-51 for assumptions).

### **3.5. Diversion Modeling of Price, Reliability, and Transit Time**

Oliver Wyman's diversion models are designed to capture the core factors that drive shipper mode and route choice: price, reliability (through interline vs. single-line), and transit time.

The **truck-to-rail** diversion model predicts how a lane will respond to improved rail service by examining outcomes in comparable markets (origin to destination lanes). This mirrors reference-class forecasting, which bases projections on the performance of similar real-world cases rather than on assumptions about a single lane. The truck-to-rail model groups markets by distance and commodity type, and by transit-time and price differences relative to truck service.

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<sup>31</sup> See Exhibit B-44

Where the UP-NS merger would create new single-line opportunities, the model matches those lanes to existing markets with similar service characteristics. These “lookalike” or “archetype” markets provide the observed shipper behavior used to forecast how the improved lane is likely to perform once mature.

For example, a 1,500-mile Houston-Cleveland tank-truck lane that would gain single-line service post-merger is matched to similar lanes where single-line rail service already exists. The rail share observed in those comparable markets is then used to predict the rail share for the improved lane. This approach naturally incorporates the key drivers of shipper choice – price, reliability, and transit time – because it relies on actual shipper behavior in markets where single-line rail competes directly with truck.

**The rail-to-rail diversion model**, by contrast, is a logit model of route choice. The model evaluates relative attractiveness of rail routes based on two key variables:

- Impedance, a quantitative measure that incorporates length-of-haul and expected interchange-related delay; and
- Junction frequency, the number of interchanges between different railroad families on a route.

These two measurable characteristics serve as practical proxies for the underlying factors that drive shipper preference on price, reliability, and transit time, while the relative importance differs by service type.

The route with higher impedance generally has longer transit time. Additional interchanges increase price, reduce reliability, and lengthen transit time, making a route less competitive. The logit model uses these two key variables to estimate the probability that shippers will select each available route. The model is calibrated using historical data to ensure that predicted choices

reflect the way shippers have actually responded to cost, reliability, and transit time differences in real markets.

Service type is captured by segmenting the traffic and calibrating each service type separately so that merchandise, intermodal, bulk, and automotive traffic receive appropriate logit model coefficients. While shipper behavior will be reflected in the two variables of impedance and junction frequency, the relative weight between additional miles (impedance) and additional interchanges will differ.

Importantly, actual traffic data confirms that impedance and junction frequency reliably predict shipper choices. Exhibit 3-7 shows that the highest share route in a market almost always has the lowest impedance and the fewest junctions.

For merchandise traffic, the highest share route has the lowest impedance 84% of the time and the lowest junction frequency 95% of the time.

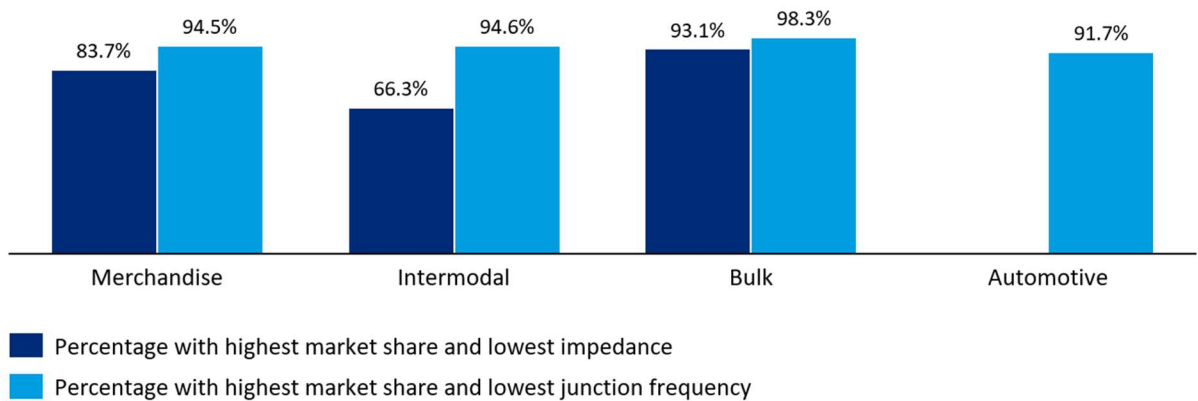
Bulk traffic showed the highest market share for routes with the lowest impedance 93% of the time and the lowest junction frequency 98% of the time.

For intermodal traffic, the low-impedance lane had the highest share nearly two-thirds of the time, and the low-junction frequency lane had the highest share 95% of the time. The wider geographic scope of a market when drayage to the final destination is available means that additional rail-miles in the route – provided the terminal to terminal transit time is comparable – matters less in intermodal than for merchandise and bulk, resulting in the low-impedance lane being less important than for other service types.

For automotive, the impedance term was not used, since automotive manufacturers prefer to consolidate deliveries at a common unloading ramp for the final-mile truck operation. The competitive destination Business Economic Areas (“BEAs”) will have similar rail mileages and

transit times from the automotive assembly plant or import port.<sup>32</sup> The data showed that impedance was not a critical factor in selecting rail routes for automotive shipments. Junction frequency is a critical consideration for shippers, with the highest market share going to the route with the lowest number of junctions 92% of the time. Handlings, including interchanges, are important for automotive OEMs because of the risk of costly damage to finished vehicles. An automotive shipper thus places high value on single-line routes over alternatives requiring interchange, based on the observed data.

**Exhibit 3-7: Percentage of markets where the highest market share route has the lowest impedance and/or junction frequency<sup>33</sup>**



In sum, both models are appropriate for this estimation exercise. The truck-to-rail model relies on close analogues in real markets to capture how improvements from introducing single-line service will shift shipper mode choice from truck to rail. The rail-to-rail model uses a well-established logit framework to quantify how clearly defined and measurable route attributes – impedance and junction frequency – drive shipper routing choice among rail alternatives. Both

<sup>32</sup> BEA definitions are used as described in “Transearch 2023 Reference Guide.pdf.” Specifically, the USA BEAs - 1995 definitions are used (defined by the Bureau of Economic Analysis), Mexican states (coded by Transearch to a FIPS), and Canada Market Areas (coded by Transearch to FIPS, which is a mix of Census Metropolitan Areas defined by Statistics Canada and Transearch groupings).

<sup>33</sup> See workpaper “HC-Filtered 100% Waybill Data Calibration.xlsx.”

approaches are grounded in real-world shipper behavior (revealed in routing and market shares) and align with the core economic drivers of freight transportation markets.

## 4. Truck-to-Carload Rail Traffic Diversions

### 4.1. Truck-to-Carload Rail Introduction

For the purposes of the analysis, all commodities were classified as either likely to ship by carload or intermodal when converted to rail.<sup>34</sup> This section focuses solely on carload commodities moving by truck (e.g., chemicals, grain, steel). The diversion of trucks carrying intermodal commodities (e.g., retail, furniture, machinery) is covered in Section 5.

A UP-NS merger would remove an estimated 857,000 truckload movements from roads by converting this traffic to rail carload movements. This would be expected to add, for a merged UP-NS, 191,000 new carloads of merchandise/bulk<sup>35</sup> traffic and 5,000 new multilevels transporting finished vehicles (Exhibit 4-1).<sup>36</sup>

**Exhibit 4-1: Estimated truck-to-rail carload diversions to a merged UP-NS<sup>37</sup>**

| Category          | Estimated trucks diverted | Equivalent rail carloads |
|-------------------|---------------------------|--------------------------|
| Merchandise/bulk  | 850,000                   | 191,000                  |
| Finished vehicles | 7,000                     | 5,000                    |
| <b>Total</b>      | <b>857,000</b>            | <b>196,000</b>           |

The primary roadways that could see a significant reduction in trucks are concentrated across the South, Southeast, and Midwest, linking those regions with the Northeast and the West. Key corridors along these routes include I-20, running across Texas and the Southwest; I-70, connecting the Midwest with the Northeast/Mid-Atlantic; and I-40, linking the Southwest to the Southeast (Exhibits 4-2 and 4-3).

<sup>34</sup> See workpaper “STCC4-CLvsIM.xlsx.”

<sup>35</sup> “Merchandise/bulk” as used in this section includes all truck commodities that are not intermodal or finished vehicles and that could be potentially divertible to rail.

<sup>36</sup> Multilevel railcars are used to transport finished vehicles (STCC 3711).

<sup>37</sup> See workpaper “C-Trucks Diverted from Highway vFinal.xlsx.” Reflects loads only, no empties.

**Exhibit 4-2: Estimated truck-to-rail carload diversions for a merged UP-NS<sup>38</sup>**

State-to-state lanes with more than 10,000 estimated annual diverted truckloads (bidirectional, no empties)

| State-to-state lane |              | Estimated diverted truckloads (bi-directional) | Selected interstates likely to see reductions in trucks |
|---------------------|--------------|------------------------------------------------|---------------------------------------------------------|
| Texas               | Alabama      | 25,000                                         | I-20, I-10                                              |
| Texas               | Ohio         | 22,000                                         | I-70, I-44, I-20                                        |
| Texas               | Pennsylvania | 17,000                                         | I-80, I-70, I-44, I-20                                  |
| Texas               | Georgia      | 17,000                                         | I-20                                                    |
| Texas               | Tennessee    | 14,000                                         | I-30, I-40                                              |
| Indiana             | Iowa         | 14,000                                         | I-80, I-65, I-74                                        |
| Texas               | Indiana      | 13,000                                         | I-70, I-44, I-20, I-55, I-40, I-30                      |
| Texas               | New York     | 13,000                                         | I-20, I-30, I-40, I-70, I-78, I-80, I-81                |
| Louisiana           | Georgia      | 13,000                                         | I-20, I-65                                              |
| Ohio                | Iowa         | 13,000                                         | I-80, I-74, I-70                                        |
| Georgia             | California   | 11,000                                         | I-10, I-20                                              |
| Texas               | Michigan     | 10,000                                         | I-94, I-74, I-55, I-57, I-44, I-20                      |
| Ohio                | Louisiana    | 10,000                                         | I-10, I-20, I-55, I-40, I-65, I-71                      |
| Pennsylvania        | Nevada       | 10,000                                         | I-80                                                    |

This traffic will benefit from new single-line services in the UP-NS Optimized Plan, which will be further enhanced in the UP-NS Growth Plan as the network onboards new traffic. Two planned new trains will be key enablers for converting this freight from trucks to manifest carload rail service: 1) The new North Platte-Conway manifest train, which bypasses the Chicago gateway, will provide single-line service and remove handlings in lanes from the Western US and Iowa into the Midwest (Ohio, Indiana, etc.). 2) The new North Little Rock-Conway manifest train pair via Sidney, IL will eliminate multiple handlings and out-of-route miles via the St. Louis gateway for traffic moving in lanes that run between Texas and Indiana,

<sup>38</sup> See workpaper “C-Section 4 Exhibits vFinal.xlsx.”

Michigan, northern Ohio, and the Northeast.<sup>39</sup> Both trains will reduce transit time for this freight and improve reliability as handlings at gateway interchanges are removed.

**Exhibit 4-3: Estimated truckloads removed from roadways by truck-to-carload rail diversions<sup>40</sup>**  
All highway lanes with at least 1,000 annual truckloads diverted in at least one direction



Below, **Section 4.1.1** provides a high-level overview of the traffic diversion modeling approach for finished vehicles and merchandise/bulk (see Appendix B for details). **Sections 4.2 and 4.3** then break down total carload diversions from trucks by merchandise/bulk and finished vehicles, respectively.

#### **4.1.1. Overview of Truck-To-Carload Rail Diversion Modeling Assumptions**

The following key assumptions were made in modeling truck-to-carload rail traffic diversions for finished vehicles and merchandise/bulk. See Appendix B for additional detail.

<sup>39</sup> STB Finance Docket No. 36873, Union Pacific Corporation et. al. – Control – Norfolk Southern Corporation et. al., Operating Plan Verified Statement, Figure 26.

<sup>40</sup> Based on county origin–destination pairs using TransCAD’s highway route assignment. Some links may appear spatially disjointed from the larger network when the minimum traffic threshold is applied. See workpapers “fml.2026.t2r\_lane\_level\_diversions\_final” and “fml\_2026.t2r\_auto\_diversions”; see Appendix B.12 for converting truckloads to carloads/intermodal units. Map created using TransCAD Transportation Planning Software and Oliver Wyman diversion analysis data.

**Exhibit 4-4: Key assumptions for truck-to-rail diversion modeling**

| <b>Assumption</b>                               | <b>Description</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|-------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Traffic base year</b>                        | <ul style="list-style-type: none"> <li>• 2023 base year for all traffic, with no forecast of future years</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>Traffic sources</b>                          | <ul style="list-style-type: none"> <li>• 100% waybill data for rail traffic characteristics (e.g., rail tons) <ul style="list-style-type: none"> <li>– Representative county-county rail route characteristics from lowest impedance paths are generated from stations in the same 100% waybill data</li> </ul> </li> <li>• Transearch, S&amp;P Global Markets, 2023 freight flow database for truck traffic <ul style="list-style-type: none"> <li>– Modes include truckload, private trucks, and trucks not elsewhere classified. Less-than-truckload excluded, since unlikely to divert to rail</li> <li>– For merchandise/bulk, five truck types considered: dry van, tank, bulk, reefer, and flatbed. Excluded STCC4 refrigerated commodities from Transearch that UP and NS recommended would not convert to rail (see Exhibit B-26). All others allowed as potential diversions</li> <li>– For finished vehicles, only STCC 3711 considered</li> <li>– Transearch data defines any truck with temperature control components as a reefer truck type; however, many of these trucks are more accurately defined as other truck types based on the type of railcar which that commodity would travel in and were overridden in the data to no longer be a reefer truck type</li> </ul> </li> </ul> |
| <b>Geography/<br/>markets/traffic<br/>types</b> | <ul style="list-style-type: none"> <li>• All geography at a county-to-county level, the base level of Transearch</li> <li>• Only US domestic (i.e., origin and destination counties in the US) truck moves considered for diversions (i.e., no transborder) for carload merchandise and automotive</li> <li>• A “market” = origin county, destination county, and traffic type, with the exception of finished vehicle destinations, which are based on destination BEA</li> <li>• Traffic types are merchandise/bulk and finished vehicles, based on commodity<sup>41</sup></li> <li>• Traffic O/Ds remained fixed. Source competition/geographic substitution not modeled</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>Rail industry<br/>changes since<br/>2023</b> | <ul style="list-style-type: none"> <li>• Base 2023 traffic does not include industry changes since 2023 from mergers/acquisitions involving CP-KCS, CSXT-Pan Am,<sup>42</sup> and CN-Iowa Northern, and other network changes involving BNSF-Montana Rail Link</li> <li>• These combinations were considered when determining if UP-NS would provide improved rail service in a market. No effort was made to estimate any truck diversions that might have occurred from prior mergers/acquisitions or other network changes</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>Permitted<br/>diversions</b>                 | <ul style="list-style-type: none"> <li>• Only permitted in markets where UP-NS service is expected to be better than current rail service (including recent mergers and acquisitions), where “better” is defined as shorter distance, lower price, and/or lower transit time</li> <li>• At least two railcars per week of a given commodity (STCC2) must originate from a county for a market to be eligible for diversion</li> <li>• Applied screens for markets unlikely to divert based on geography and rail characteristics</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |

<sup>41</sup> See workpaper “STCC4-CLvsIM.xlsx.”

<sup>42</sup> Although Springfield Terminal Railways (SCAC = ST) became part of CSXT in its 2022 acquisition of Pan Am Railways, traffic records in 2023 continued to use ST.

## **4.2. New Merchandise/Bulk Rail Carloads**

### **4.2.1. Approach, Assumptions, and Market Definitions**

Merchandise and bulk commodities were treated the same way in the diversion model, since it is unlikely that any truck-to-rail carload diversions will be of sufficient point-to-point volume to result in the unit train service that railroads typically provide for bulk commodities. All bulk truck diversions were thus treated, for revenue estimation and operations planning, as merchandise carloads that would move on the manifest train network.

A lookalike analysis was used to estimate the number of trucks transporting merchandise/bulk commodities that a UP-NS merger could divert from road to conventional railcar loads. As discussed briefly in Section 3, the theory behind using a lookalike analysis is that shippers' mode choice is based on price, transit time, interchanges, and reliability, and shippers of a given commodity behave consistently on a national basis. Therefore, rail lanes with similar characteristics versus truck are expected to have a similar rail market share. If service characteristics change, then market share will change as well to match the most relevant existing lanes.

A lookalike analysis is appropriate for estimating diversions of merchandise/bulk trucks because it captures the key features of complex shipper behavior, without relying on false precision from estimating door-to-door transit times and market-based prices for truck and rail. Lookalike analysis is a common methodology, used for example in digital marketing to identify potential customers with characteristics similar to those of existing customer profiles. This approach was applied to compare freight markets with improved rail service post-merger to existing freight markets that have comparable levels of rail service already (Exhibit 4-5).

**Exhibit 4-5: Comparison of average truck vs. rail share for all lanes where merchandise/bulk trucks are diverted to UP-NS<sup>43</sup>**

Percentage rail share of total truck and rail tons

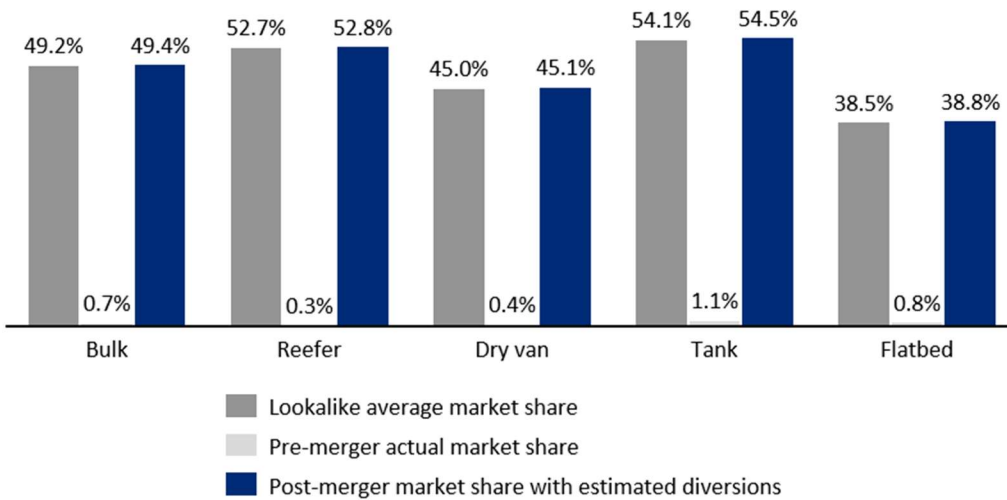


Exhibit 4-5 walks through how the lookalike analysis performs as expected. For all competitive<sup>44</sup> lanes where merchandise/bulk trucks are diverted to UP-NS, rail is most competitive with truck in the tank truck market. Next, for lanes that would see estimated diversions due to a UP-NS merger, those lanes today severely underperform compared to truck (0.3%-1.1% market share).

After the UP-NS merger improves service in these lanes, primarily by turning interline service into single-line (c), the lookalike analysis compared these improved lanes to groups of existing similarly competitive single-line lanes. As a result, improved lanes are predicted to divert trucks to reach a rail share much closer to existing single-line lanes. Tank truck diversions are a prime example: on average, rail has a 54.1% market share for single-line served lanes; the predicted market share on lanes improved by the merger is 54.5%, up from 1.1% currently.

<sup>43</sup> Transearch, op. cit.; 100% waybill data; workpaper “HC-Lane Level Diversions Mileage vFinal.xlsx.”

<sup>44</sup> “Competitive” defined as county-county lanes where truck and rail both offer service. See Appendix B.5.1 for what is included in this traffic.

A specific example of how the model predicts rail market share is outlined below, using the largest tank truck-to-rail carload diversion from Nueces County, TX to Morgan County, AL. The UP-NS merger would improve service by converting this lane to single-line service, thus decreasing rail transit time and price for shippers. This would cause the lane characteristics to change, resulting in a move from 0% rail market share now to an estimated 77% market share post-merger (Exhibit 4-6).

**Exhibit 4-6: Pre-merger vs. estimated post-merger rail characteristics for a Nueces County, TX-Morgan County, AL chemicals lane<sup>45</sup>**

|                             | Pre-merger | Post-merger |
|-----------------------------|------------|-------------|
| <b>Miles</b>                | 1,063      | 967         |
| <b>Interchanges</b>         | 1          | 0           |
| <b>Transit hours</b>        | 180        | 145         |
| <b>Revenue per ton-mile</b> | \$0.069    | \$0.057     |
| <b>Rail market share</b>    | 0%         | 77%         |

Exhibit 4-7 shows some of the largest lanes comprising the new group of similar lanes to which this lane would now belong. This group’s rail market share is 77%, calculated from a weighted average of 2,353 lanes (total rail plus truck market). Complete details on the lookalike methodology can be found in Appendix B.5.2.C.

**Exhibit 4-7: Top 10 lanes by total market size that make up the archetype to which the Nueces County, TX to Morgan County, AL chemicals lane would belong post-merger<sup>46</sup>**

| Origin county/region  | Destination county/region | STCC2 | Single-line or interline | Rail market Share | Total market (tons) |
|-----------------------|---------------------------|-------|--------------------------|-------------------|---------------------|
| Sweetwater County, WY | Cowlitz County, WA        | 28    | Single-line              | 100%              | 626,524             |
| Harris County, TX     | Cook County, IL           | 28    | Single-line              | 89%               | 190,341             |
| Platte County, NE     | Harris County, TX         | 28    | Single-line              | 97%               | 103,455             |
| Brazoria County, TX   | Cook County, IL           | 28    | Single-line              | 52%               | 72,193              |
| Madison County, IL    | New Castle County, DE     | 28    | Single-line              | 99%               | 62,424              |
| Madison County, IL    | Duval County, FL          | 28    | Single-line              | 99%               | 55,278              |

<sup>45</sup> See workpaper “t2merch\_lane\_archetype\_exhibits\_2026\_vFinal.ipynb.” See Appendix B.8 for transit hours methodology and Appendix B.6 for revenue per ton-mile methodology.

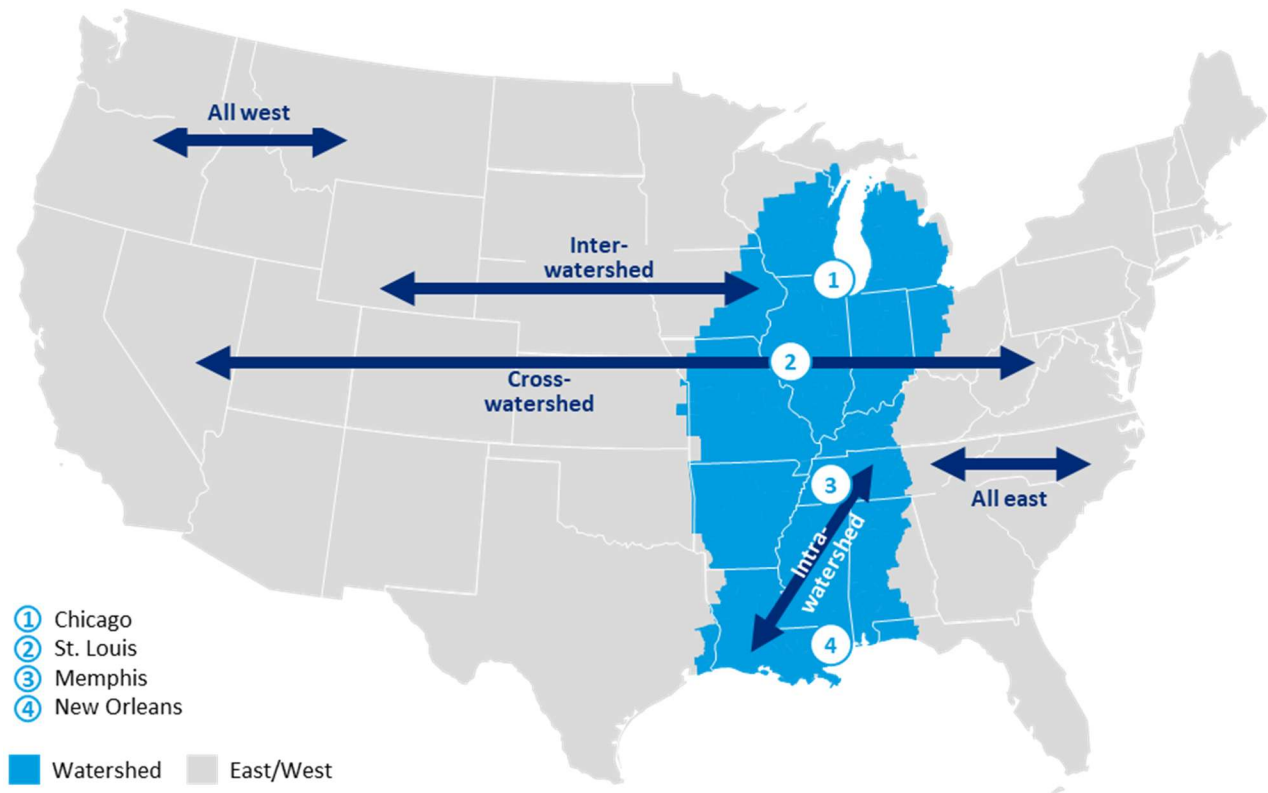
<sup>46</sup> Ibid.

| Origin county/region      | Destination county/region | STCC2 | Single-line or interline | Rail market Share | Total market (tons) |
|---------------------------|---------------------------|-------|--------------------------|-------------------|---------------------|
| Harris County, TX         | Greenlee County, AZ       | 28    | Single-line              | 100%              | 51,517              |
| Contra Costa County, CA   | Greenlee County, AZ       | 28    | Single-line              | 100%              | 45,874              |
| Calcasieu Parish, LA      | Cook County, IL           | 28    | Single-line              | 23%               | 43,030              |
| Calcasieu Parish, LA      | Grundy County, IL         | 28    | Single-line              | 100%              | 30, 833             |
| <b>Top 10 lanes total</b> |                           |       |                          | <b>Avg: 93%</b>   | <b>1,281, 469</b>   |
| <b>All other</b>          |                           |       |                          | <b>Avg: 58%</b>   | <b>1,057, 637</b>   |
| <b>Grand total</b>        |                           |       |                          | <b>Avg: 77%</b>   | <b>2,339,106</b>    |

#### 4.2.2. Carload Rail Merchandise/Bulk vs. Truck Performance in the Watershed Region

Much of US Class I interline traffic involves traffic within or crossing the watershed region, the traditional dividing line between eastern and western US railroads (Exhibit 4-8). The eastern railroads do not generally operate west of the watershed, and the western railroads do not generally operate east of the watershed. For most rail traffic to move from one side of the watershed to the other, an interchange is required at gateways such as Chicago, IL; St. Louis, MO; Memphis, TN; or New Orleans, LA.

**Exhibit 4-8: Watershed region and lane type definitions<sup>47</sup>**

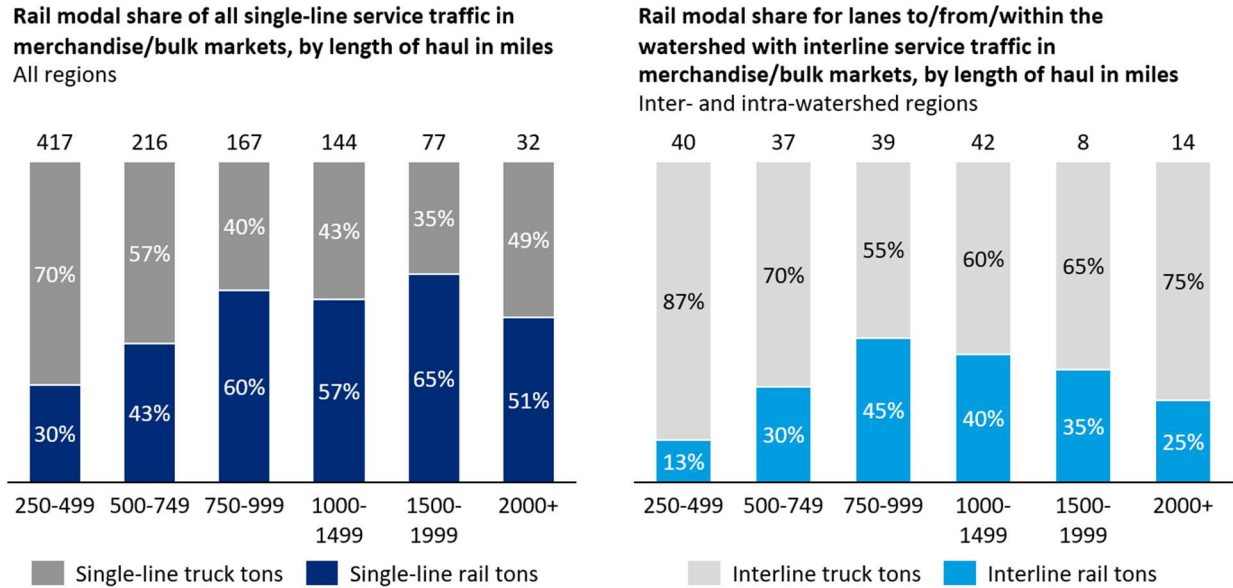


Rail historically captures less share against trucks for traffic to, from, or within the watershed, especially for carload merchandise/bulk traffic using interline service, as shown in Exhibit 4-9.

<sup>47</sup> The “watershed region” is defined as any county within 250 miles of four gateway cities: Chicago, St. Louis, Memphis, and New Orleans. See Appendix B.5.3 for more details on the watershed region definition.

**Exhibit 4-9: Total single-line rail modal share versus interline rail modal share for lanes to/from/within the watershed<sup>48</sup>**

Millions of tons excluding Crude Oil (STCC2 = 11), Coal (STCC2 = 13), and transborder lanes; percent share of rail vs. truck



To isolate the performance effects associated with the so-called “watershed problem,” data was screened to focus specifically on traffic moving to, from, and within the defined watershed region under conditions where rail service involves an interchange (see Exhibit 4-10). In particular, the sample was limited to lanes lacking a direct single-line rail alternative, such that any rail movement must be handled via interline service between two carriers. This approach targets the operational scenario at the core of the watershed issue: for example, traffic originating in the West (e.g., Los Angeles), interchanged at Chicago, and terminating within the watershed region, where the receiving carrier’s short-haul segment may weaken incentives or performance relative to competing truck service. The challenges are even larger for traffic within the watershed (e.g., Baton Rouge, LA to Huntsville, AL), as both railroads would each receive a

<sup>48</sup> Analysis only considers Class I railroads, exclusive of short line and regional railroads, when defining interline and single-line; see workpaper “C-Section 4 Exhibits vFinal.xlsx.”

short-haul move. By contrast, lanes were excluded where single-line service was available (such as uninterrupted service from Chicago westward or eastward), even if these lanes traverse the watershed region, because such traffic does not involve the interline dynamics central to the watershed problem.

**Exhibit 4-10: Rail market share in watershed vs. outside watershed<sup>49</sup>**

Millions of merchandise rail tons, excluding Crude Oil (STCC2 = 11), Coal (STCC2 = 13), and transborder lanes; percent share of total rail vs. truck

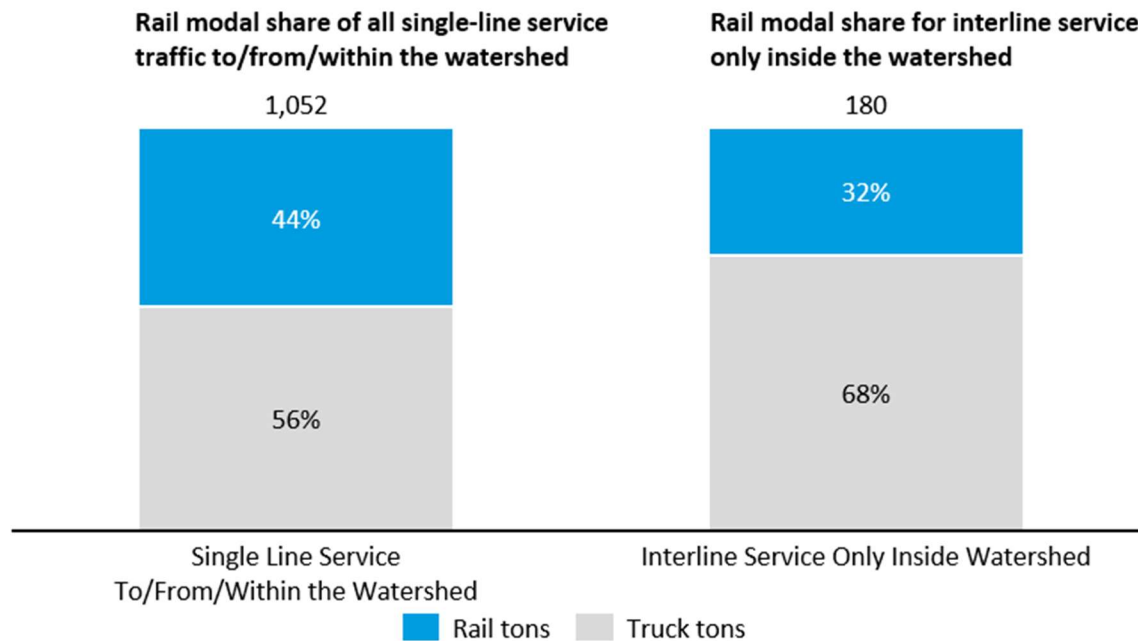
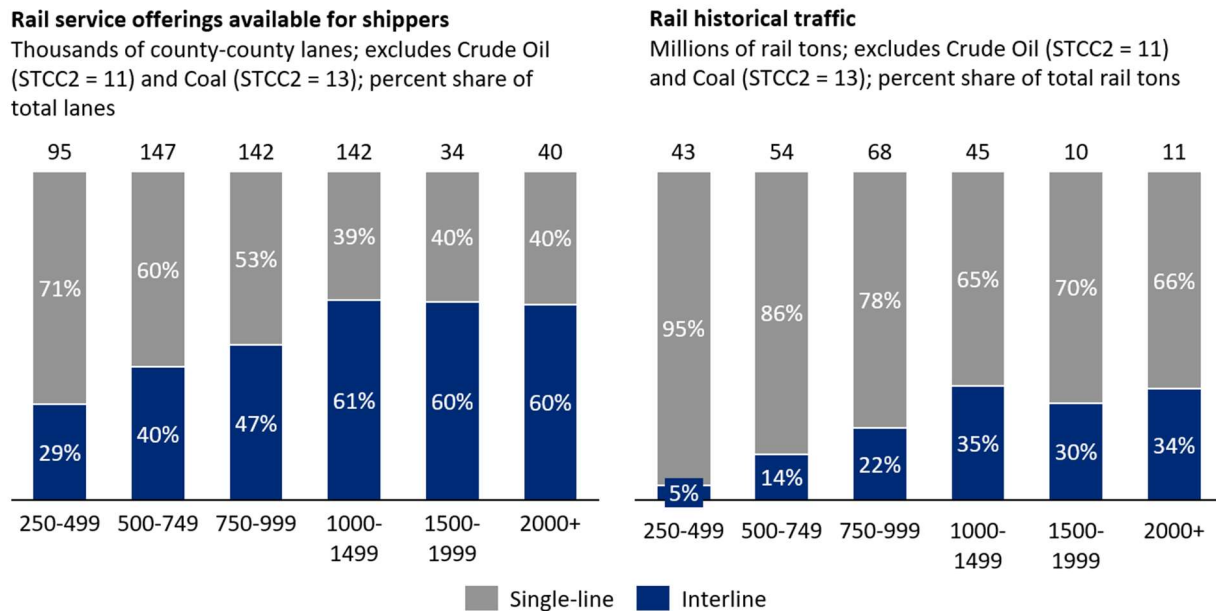


Exhibit 4-11 further demonstrates how single-line service outperforms interline service within the watershed region. In inter-watershed lanes, much of the available rail service currently is interline. About half of inter-watershed lanes are served by single line service (left-hand side of Exhibit 4-11), yet single line service accounts for 80% of rail tons moving in these lanes (right-hand side of Exhibit 4-11). Put simply, when a shipment can move on a single railroad from origin to destination within the watershed region, it does so. Shippers in this region clearly

<sup>49</sup> Analysis only considers Class I railroads, exclusive of short line and regional railroads, when defining interline and single-line; See workpaper “C-Section 4 Exhibits vFinal.xlsx.” Figure based on CRA analysis of the 100% waybill file, inclusive of all merchandise and bulk commodities except for minimal truck cuts (e.g., wet cement, livestock).

favor service that avoids the need for handoffs between carriers at a gateway such as Chicago. The data reflected in Exhibit 4-11 show that, even where single-line options are relatively limited today, shippers disproportionately choose them when they are available. This pattern suggests that as a UP-NS merger introduces more single-line service within the watershed region, more traffic could be expected to divert to these new single-line offerings.

**Exhibit 4-11: Inter-watershed lanes: current service offerings and historical traffic<sup>50</sup>**



#### 4.2.3. Estimated Traffic Diversions for Merchandise/Bulk to Conventional Rail Carload

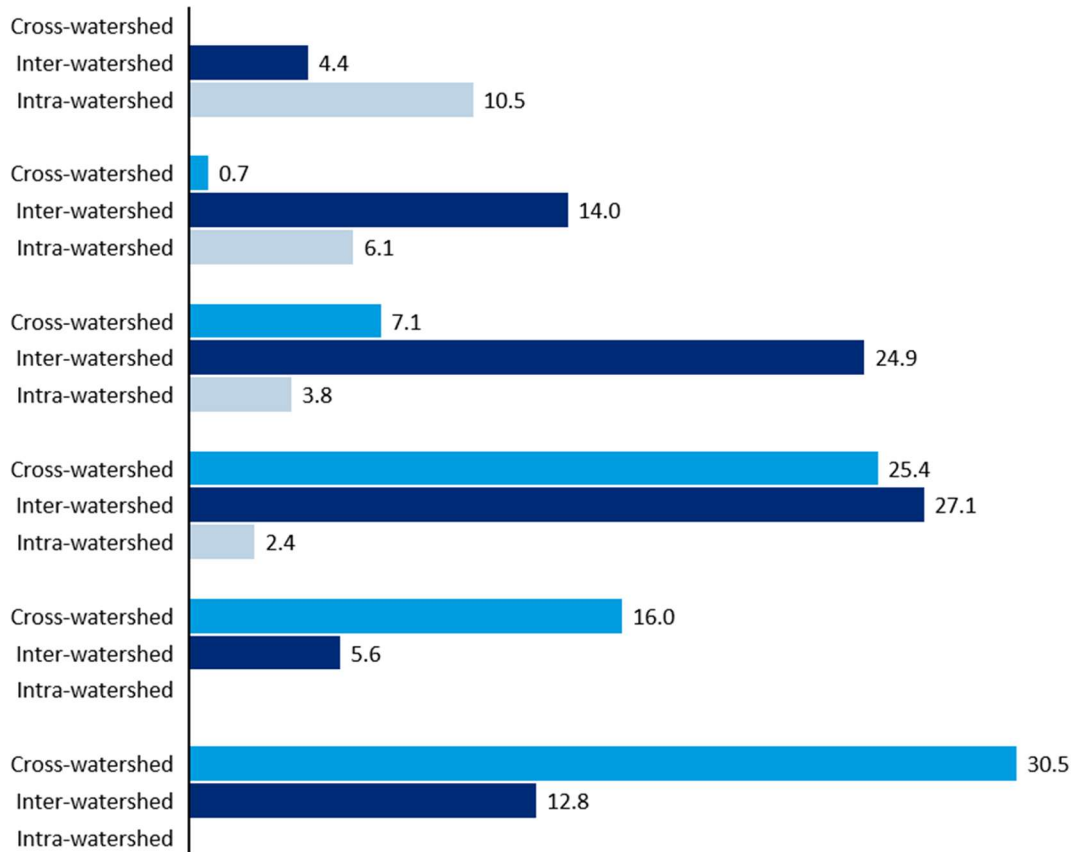
The UP-NS merger would divert an estimated 850,000 merchandise and bulk truckloads from highways to conventional rail service, equivalent to about 191,000 rail carloads (Exhibit 4-12; see Appendix B.12 for conversion methodology). Most of these diversions are projected to occur in cross-watershed and inter-watershed lanes, reflecting improved single-line service between the western United States and the eastern portion of the watershed region. It is also

<sup>50</sup> See workpaper “t2merch\_watershed\_summary\_2026\_vFinal.ipynb.”

important to note that major sources of traffic (e.g., from Texas and Indiana) are adjacent to the watershed region and therefore contribute to cross-watershed traffic.

**Exhibit 4-12: Estimated merchandise/bulk truck-to-rail carload diversions by lane type<sup>51</sup>**

Thousands of rail carloads; total = 191,000 carloads

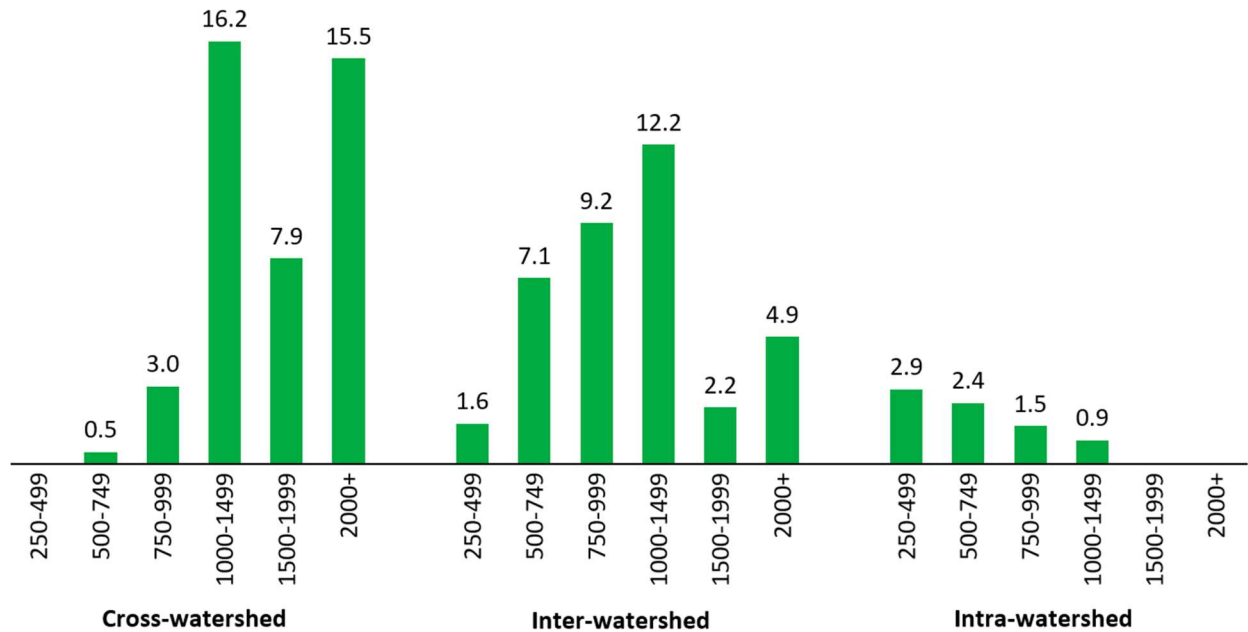


These diversions are driven by the merger's creation of single-line service in lanes solely served by interline rail movements today. As shown in Exhibit 4-13, the merger would introduce an estimated 88,000 new single-line county-county lanes; 49% of these lanes would cross the watershed, while 42% would be inter-watershed lanes.

<sup>51</sup> Ibid.

**Exhibit 4-13: New single-line lanes introduced by a UP-NS merger<sup>52</sup>**

Thousands of county-county lanes; total = 88,000



The state-to-state lanes expected to generate the largest merchandise and bulk truck-to-rail diversions all cross the watershed, including Texas-Pennsylvania, Texas-Ohio, and Texas-Alabama. Texas, Louisiana, and Iowa are projected to be the leading origin states, with Texas and Louisiana primarily contributing chemicals, petroleum products, and food products; and Iowa, Arkansas, California, and Wisconsin contributing food products along with chemicals, nonmetallic ores, lumber, petroleum, clay products, and paper products.

Ohio, Pennsylvania, and Georgia are expected to be the principal destination states. The top ten destination states collectively account for 63% of projected truck-to-rail diversions. Chemicals, food products, and petroleum products represent the most frequently diverted commodities (Exhibit 4-14; see Appendix B.11 for detail).

The UP-NS Growth Plan incorporates new manifest train services to accommodate this traffic, including eight new train pairs on legacy interline routes. The new legacy interline routes

<sup>52</sup> Ibid.

specifically support watershed traffic. Notably, a new North Little Rock, AR–Conway, PA train pair will enable efficient movement of Texas/Louisiana originations bypassing the major gateways over Sidney, IL to destinations in the Ohio Valley and Northeast, and empty returns. These services, developed by the railroads’ service design teams, demonstrate how the UP-NS Growth Plan is designed to deliver the transit time improvements necessary to successfully convert freight from the highway.

**Exhibit 4-14: Top 10 O/D pairs diverting truck-to-rail merchandise/bulk traffic<sup>53</sup>**

| Lane                              | Est. diverted carloads | Top commodities diverted                                                                                                                                                                        |
|-----------------------------------|------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| TX-PA                             | 4,000                  | <ul style="list-style-type: none"> <li>• Chemicals or allied products</li> <li>• Petroleum or coal products</li> <li>• Food and kindred products</li> </ul>                                     |
| TX-OH                             | 4,000                  |                                                                                                                                                                                                 |
| TX-AL                             | 3,000                  | <ul style="list-style-type: none"> <li>• Chemicals or allied products</li> <li>• Food and kindred products</li> <li>• Petroleum or coal products</li> </ul>                                     |
| TX-NY                             | 3,000                  | <ul style="list-style-type: none"> <li>• Petroleum or coal products</li> <li>• Chemicals or allied products</li> <li>• Food and kindred products</li> </ul>                                     |
| IA-IN                             | 3,000                  | <ul style="list-style-type: none"> <li>• Food and kindred products</li> <li>• Chemicals or allied products</li> <li>• Nonmetallic ores, minerals, excluding fuels</li> </ul>                    |
| IA-OH                             | 3,000                  |                                                                                                                                                                                                 |
| TX-GA                             | 2,000                  | <ul style="list-style-type: none"> <li>• Chemicals or allied products</li> <li>• Petroleum or coal products</li> <li>• Food and kindred products</li> </ul>                                     |
| AL-TX                             | 2,000                  | <ul style="list-style-type: none"> <li>• Nonmetallic ores, minerals, excluding fuels</li> <li>• Chemicals or allied products</li> <li>• Lumber or wood products, excluding furniture</li> </ul> |
| TX-NC                             | 2,000                  | <ul style="list-style-type: none"> <li>• Petroleum or coal products</li> <li>• Chemicals or allied products</li> <li>• Food and kindred products</li> </ul>                                     |
| TX-NJ                             | 2,000                  | <ul style="list-style-type: none"> <li>• Petroleum or coal products</li> <li>• Chemicals or allied products</li> <li>• Food and kindred products</li> </ul>                                     |
| <b>Top 10 total</b>               | <b>28,000</b>          |                                                                                                                                                                                                 |
| <b>Grand total</b>                | <b>191,000</b>         |                                                                                                                                                                                                 |
| <b>Top 10 as % of grand total</b> | <b>14%</b>             |                                                                                                                                                                                                 |

<sup>53</sup> See workpaper “C-Section 4 Exhibits vFinal.xlsx.”

### **4.3. New Finished Vehicle Rail Carloads**

#### **4.3.1. Approach, Assumptions, and Market Definitions**

This section outlines the approach for estimating the finished vehicle traffic that could realistically divert from truck to rail as a result of the UP-NS merger. Using the 2023 S&P Global Transearch database as the baseline, the model started with 47.7 million tons of finished vehicles (STCC 3711) moving by truck and systematically narrowed this universe to isolate lanes where diversion to rail is operationally feasible and commercially realistic. Through a series of quantitative screens and a subsequent qualitative review informed by UP and NS subject-matter experts, 418,000 tons were identified as potentially divertible under improved single-line service. Applying additional market- and facility-access criteria reduced this to 123,000 tons across 36 origin-destination lanes. The steps in this filtering process are detailed below.

To calculate the potentially divertible tonnage of 418,000 from the 47.7 million total finished vehicle tons in the Transearch truck traffic, the following records were eliminated from consideration based on discussions with UP and NS personnel with knowledge of finished vehicle markets:

- Lanes less than 250 miles in length, which are not likely addressable by rail;
- Lanes that due to geographic data limitations could not be accurately identified;
- Origin points with no automotive assembly plant or port;
- Cross-border traffic, since this mostly travels by rail already;
- Ports, since finished vehicles arriving at a port are not generally trucked long-haul across the watershed region;
- Traffic originating in counties with Class 6-8 truck, school bus, and RV OEM assembly plants, as these types of vehicles are not suitable for transport by rail; and

- Lanes without rail service or where a UP-NS merger would not improve service.

The 418,000 tons of potentially divertible truck traffic were then divided into lanes based on the county of origin to the BEA of destination. The origin represents the county containing an automotive plant and the destination represents the larger market where final delivery from a rail ramp to a dealership is done by truck. This produced a limited set of lanes, which were then manually reviewed to identify feasible potential diversions. Lanes were eliminated if they failed any of the following criteria:

- The destination BEA does not have a UP or NS auto ramp.
- UP or NS does not have access to the originating OEM assembly plant.
- The OEM is known to have long-term contracts with other carriers.
- The OEM sells premium automobiles that have a higher sensitivity to transit times and risk of damage, like Mercedes in Alabama and BMW in South Carolina, and thus this traffic is less likely to shift to rail.<sup>54</sup>

This left a total of 123,000 tons in 36 county-to-BEA lanes that were considered to be realistic potential truck-to-rail diversions of finished vehicle traffic.

#### **4.3.2. Estimated Traffic Diversions for Finished Vehicles**

The finished vehicle market has unique infrastructure considerations, a consolidated shipper landscape, and high final-mile costs to deliver to dealerships compared to intermodal and merchandise/bulk traffic. Given these unique characteristics, an “all or nothing” approach for diversions was considered to be appropriate for two reasons: First, as shown in Exhibit 4-15, the average revenue rail receives from moving a finished vehicle is significantly less than what trucks receive, particularly at longer lengths of hauls. If railroads can provide improved service,

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<sup>54</sup> As evidenced by rail’s limited penetration for domestic finished vehicle deliveries, despite providing rail service from these plants to export ports.

as single-line UP-NS moves would, then the traffic is highly likely to shift from truck to rail. Second, since shippers in this industry often enter into long-term, exclusive contracts with carriers, it is expected that any diversions to UP-NS based on improved service would be all-or-nothing. Therefore, all 123,000 tons of finished vehicle traffic identified in Section 4.3.1 were treated as potential diversions.

**Exhibit 4-15: Average transportation price per finished vehicle (VIN), truck vs. rail<sup>55</sup>**

| Length of haul (miles) | Truck <sup>56</sup> | Rail <sup>57</sup> |
|------------------------|---------------------|--------------------|
| 250-499                | \$835               | \$564              |
| 500-749                | \$1,055             | \$730              |
| 750-999                | \$1,395             | \$890              |
| 1000-1499              | \$1,875             | \$1,117            |
| 1500-1999              | \$2,513             | \$1,373            |
| 2000+                  | \$3,196             | \$1,752            |

These 123,000 tons of finished vehicle traffic would translate into 5,000 new carloads for UP-NS (see Section B.4.2), and an equivalent 7,000 truckloads removed from the roadways. Originations in Michigan and Indiana would account for 86% of finished vehicle traffic diversions, with Alabama, Ohio, and Texas providing the other 14%. Arizona, California, and Texas would account for 80% of destinations. Michigan to Arizona and Michigan to California are the two highest volume lanes for diversions (Exhibit 4-16).

<sup>55</sup> See workpaper “C-Section 4 Exhibits vFinal.xlsx.”

<sup>56</sup> Truck price per mile calculated using DAT Freight & Analytics data, which details average spot and contract rates for the 10,000 highest volume US dry van lanes for 2023.

<sup>57</sup> Includes a flat haul-away cost of \$181 per finished vehicle for final-mile delivery from the rail unloading terminal to the dealership, derived from revenue per unit of company deliveries reported in Q3 2025 financial results for Proficient Auto Logistics, a publicly traded auto-hauler company that has one of the largest auto transportation fleets in North America.

**Exhibit 4-16: Top five lanes for truck-to-carload rail diversions of finished vehicle traffic<sup>58</sup>**

| Lane  | Estimated diversions<br>(carloads) |
|-------|------------------------------------|
| MI-AZ | 1,037                              |
| MI-CA | 843                                |
| IN-CA | 504                                |
| MI-TX | 456                                |
| AL-AZ | 409                                |

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<sup>58</sup> See workpaper “C-Section 4 Exhibits vFinal.xlsx.”

## **5. Truck-to-Intermodal Rail Traffic Diversions**

### **5.1. Truck-to-Intermodal Rail Introduction**

A UP-NS merger would remove an estimated 1.2 million truckload movements from the roads by converting long-haul truck traffic to intermodal rail traffic. This traffic is separate and distinct from the addressable market for truckload traffic converted to conventional railcar movements described in Section 4.<sup>59</sup> All commodities were classified as likely to ship by carload or intermodal when converted to rail for these two separate analyses at the STCC4 level (see Appendix B.2). Specific commodities are not considered in this section; instead, this section focuses on the diversion of truckloads<sup>60</sup> to intermodal containers on a one-for-one basis, as the exact commodity does not impact the resulting number of containers, railcar type, or pricing, and opportunities for extended rail linehaul into the watershed substitute for existing long-haul intermodal drayage trucking.

### **5.2. Approach, Assumptions, and Market Definitions**

This section describes the approach to estimating the volume of truck traffic that could divert to domestic intermodal rail service under a UP-NS merger. Using Transearch county-to-county trucking data in combination with the domestic intermodal waybills in the 100% waybill data, a terminal catchment area model was applied to identify the portion of the broader truck market that is realistically serviceable by intermodal rail. This model incorporates drayage economics, availability of linehaul rail service and railroad terminals, and minimum service-density thresholds to distinguish theoretical opportunities from ones in lanes where a viable rail offering could be provided.

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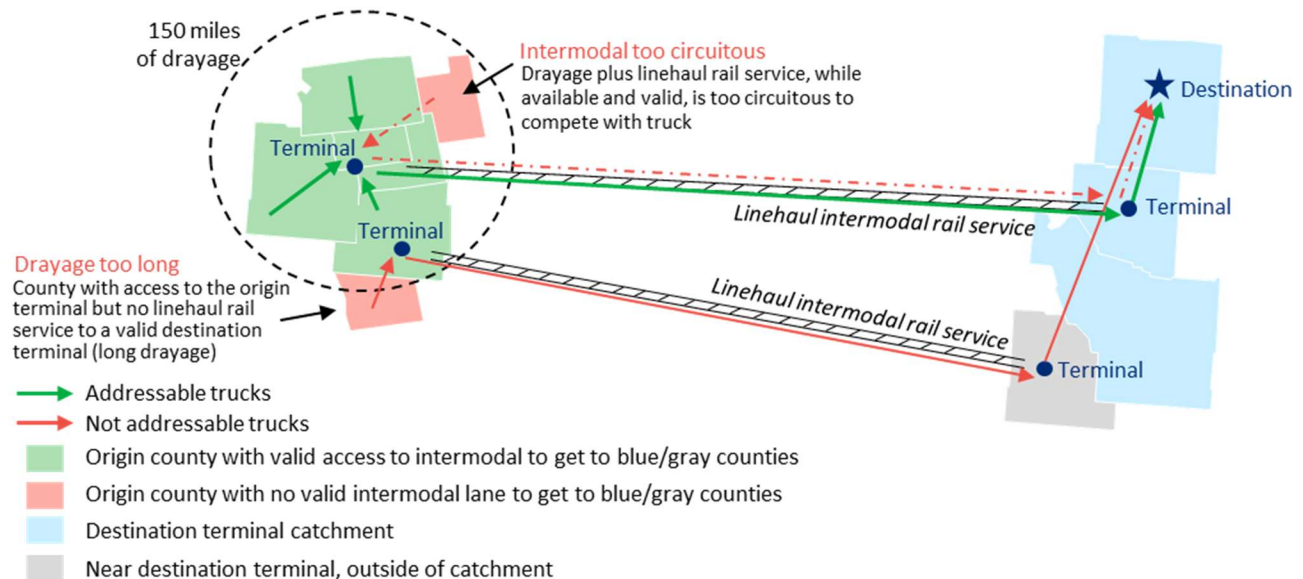
<sup>59</sup> As discussed below, an additional 70,000 movements of intermodal traffic were identified that would remain on rail for a longer distance rather than being de-ramped and drayed long distances to their destinations.

<sup>60</sup> As reported in Transearch, op. cit.

A lane-level lookalike methodology was then applied to assess modal shift potential based on observed shipper behavior in comparable markets, followed by operational feasibility tests with the railroads to ensure that any identified diversions could be competitively served by the combined network. The details of this methodology and resulting estimate of the addressable and serviceable intermodal market are presented below.

Transearch county-to-county trucking data was first combined with the domestic intermodal traffic in the 100% waybill intermodal data<sup>61</sup> and the terminal catchment area model applied (see Exhibit 5-1 and Appendix B.3.3.A) to develop a realistic sizing of serviceable trucks, a subset of the addressable market, that could be diverted from truck-to-rail intermodal traffic by lane.

**Exhibit 5-1: Illustrative: creation of intermodal lanes**



Once drayage economics and operational feasibility considerations were applied (see Section 5.3), the addressable market for diversions to rail intermodal as a result of the merger was estimated to be 2,722,000 truckloads (Exhibit 5-2). This includes 271,000 truckloads moving transborder between Mexico and the eastern United States (see Exhibit B-5).

<sup>61</sup> Transearch, op. cit., Confidential Carload Waybill Sample op. cit.

The methodology used first identified all trucks in county-to-county lanes that, incorporating business rules on drayage economics, compete with existing single-line and interline domestic rail intermodal lanes (6,216,000 truckloads), where linehaul domestic intermodal rail service is available (terminal to terminal) based on the 100% waybill data (Exhibit 5-2).

As shown in Exhibit 5-2, in addition, 20,031,000 truckloads move in lanes that theoretically could be serviceable by domestic intermodal if every domestic intermodal rail terminal had linehaul rail service to every other intermodal rail terminal (referred to as “everywhere to everywhere”). Some of this traffic (3,458,000 truckloads), however, is in lanes where UP and NS do not have terminals available at both origin and destination which means this traffic is not accessible for diversions. There also are existing intermodal terminals which only serve international intermodal today (e.g. Greer, SC). These terminals were not considered, even though they could theoretically serve domestic intermodal containers, because they are typically small footprint locations. (Two exceptions were included in this analysis after discussion with the railroads as able to serve domestic intermodal traffic: Huntsville, AL and Charleston, SC.)

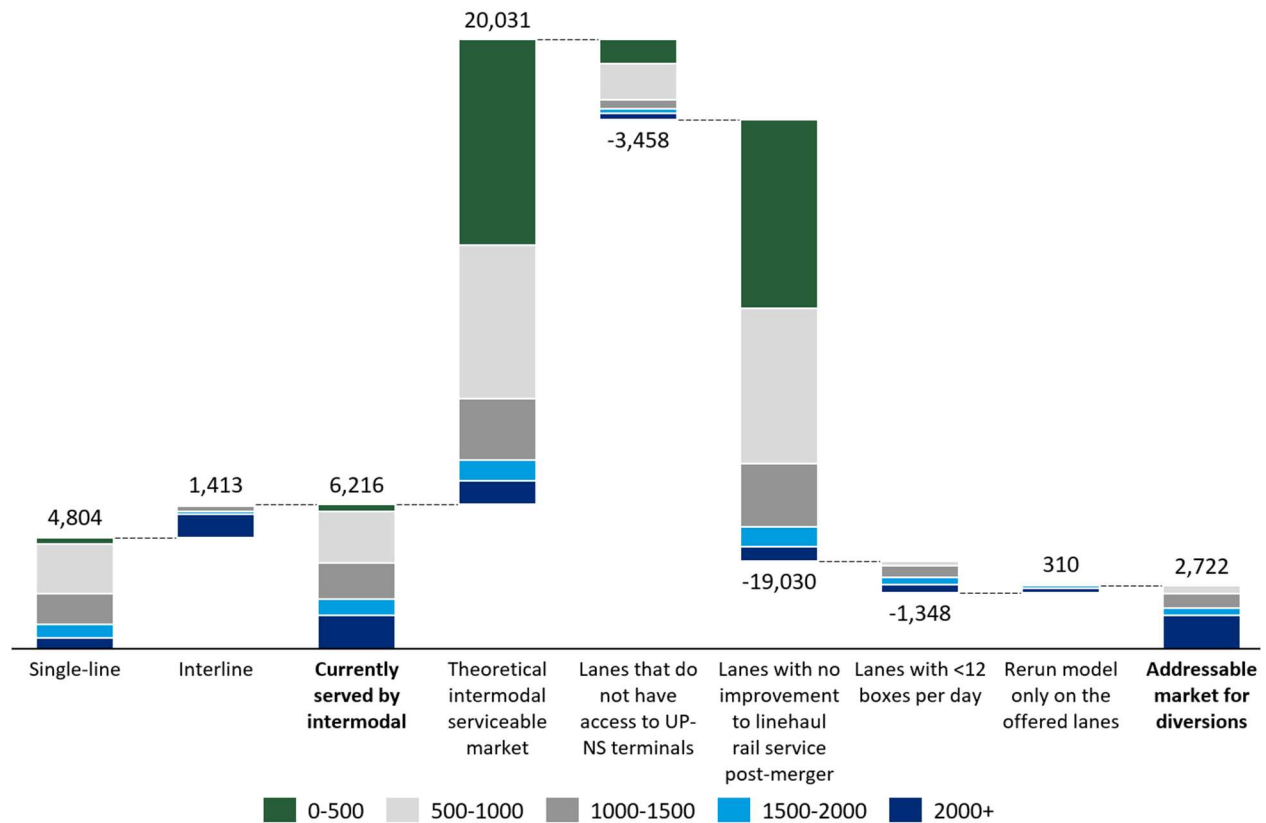
Of this, 19,030,000 truckloads are in lanes that would see no improvement to linehaul rail service post-merger.

A further 1,348,000 truckloads are in lanes with insufficient volume to ensure operation of daily intermodal service when the diversion modal share estimate is applied. For modeling purposes, the threshold was set at 12 boxes per day (two railcars per day).

The terminal catchment area model was then rerun with this new set of valid lanes: existing lanes and new lanes where the merger could improve linehaul rail service, UP or NS have terminals at origin and destination, and the minimum volume density threshold is met. This

recovers 310,000 truckloads to the addressable market for diversion that preferred theoretical lanes in the everywhere to everywhere model that will not be available post-merger (i.e., from the 3,458,000 trucks in lanes that do not have access to UP-NS terminals and the 1,348,000 trucks in low-volume lanes based on the everywhere-to-everywhere model).

**Exhibit 5-2: All addressable truckloads for truck-to-intermodal rail diversion<sup>62</sup>**  
Thousands of units



A lookalike methodology at the lane level was employed to size the potential intermodal traffic gains that could result from the merger. This relied on the following overarching assumptions:

<sup>62</sup> See workpaper “HC-Intermodal Diversions Model vFinal.xlsx.”

- Given similar trade-offs between truck and rail freight products (transit time, price, and service differentials), shippers will make their mode choice consistently across the United States.
- New UP-NS terminal-to-terminal single-line service options would result in new truck-competitive intermodal linehaul products with characteristics comparable to existing single-line service lanes offered by Class I railroads.
- There will be a meaningful improvement in the existing interline intermodal lanes offered today, and these lanes will behave like the existing single-line service lanes offered by Class I railroads.
- Decisions are made at the margin on a lane-by-lane basis, meaning shippers do not make all-or-nothing buying decisions between truck and rail.
- All domestic intermodal traffic is treated as a “gray box,” meaning that the analysis did not consider any differences based on shipper choice of railroad, trailers versus containers or channel partner.

Intermodal lanes were segmented into groups with similar characteristics (“archetypes”), including length-of-haul, interline or single-line service, transit time versus truck, and door-to-door price versus truck. The first two characteristics are rail-centric and capture how intermodal typically takes higher share in longer haul lanes and to show the difference between interline and single-line lanes in the current state. The second two capture key decision factors for shippers; that is, when intermodal can offer transit times of truck plus one day and offer a 10% lower price than truck, a shipper is likely to consider intermodal as a competitive substitute for truck.

Archetypes are described in detail in Appendix B.3.4.B.

The lookalike analysis was applied to all lanes that post-merger would see an improvement in the impedance of the best available linehaul terminal to terminal rail route. Rail route impedance is defined in the same way as in the rail-to-rail analysis, where impedance is the sum of rail miles and junction impedance and is a proxy for the quality of rail service in a lane. Post-merger improvement could shift existing lanes from one archetype to another. Unlike merchandise traffic, however, there are many terminal-to-terminal intermodal lanes that do not have linehaul rail service today. If these unserved lanes showed reduced impedance post-merger (i.e., service would improve) in the model, then the model was tested to see if sufficient trucks would be likely to divert to meet the minimum volume threshold.

After the lookalike analysis estimated the mode shift potential, operational considerations were applied (see Section 5.3). For a railroad to offer linehaul rail service, minimum density and feasible train service must be available, in addition to a UP or NS terminal being available at the origin and destination.

With these criteria, the list of existing and feasible lanes was then used to size the serviceable market a second time and apply the lookalike analysis to develop the final estimate of truck traffic volume that could potentially divert to rail intermodal as a result of the merger.

### **5.3. Operational Considerations**

To shift from truck to rail intermodal, a key requirement would be for linehaul rail service to be on offer. A railroad requires sufficient traffic density and a feasible route to offer such service. This step in the analysis ensured that the final diverted traffic was realistically distributed into lanes with the scale necessary to operate linehaul rail service. This analysis was reviewed by both railroads' intermodal marketing and service design experts to reflect operational realities.

For potential mode shift growth to be captured for rail-to-rail and truck-to-intermodal, the criteria in Exhibit 5-3 must be met.

**Exhibit 5-3: Mode shift truck-to-intermodal rail diversion criteria**

| Criterion                                                                                                                                          | Comments                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|----------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Volume density:</b> At least 12 units per day across all existing plus all diverted traffic (rail-to-rail, truck-to-intermodal, long-haul dray) | <ul style="list-style-type: none"> <li>• Includes existing international volume on an origin terminal to destination terminal basis in the headhaul direction<sup>63</sup> in a lane</li> <li>• Applied on an O/D basis and does not allow for the potential to consolidate traffic and use switching, load centering, or rubber-tire connections to build density</li> <li>• Provided at least the headhaul achieves minimum density, the backhaul also is available to take diversions (as it is unusual for a railroad to offer one-way only on a lane)</li> <li>• An exception to the volume density requirement was applied to rail-to-rail diversions from the Port of Seattle-Tacoma to three NS terminals (Georgetown, KY; Maple Heights (Cleveland), OH; and Rickenbacker (Columbus), OH) which already receive steel-wheel interline service</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>Terminal availability:</b> UP and/or NS must have a terminal in both the origin and destination intermodal markets                              | <ul style="list-style-type: none"> <li>• Third-party terminals were generally excluded, with four exceptions:             <ul style="list-style-type: none"> <li>– Huntsville, AL (owned by the state of Alabama, served by NS)</li> <li>– Titusville (Orlando), FL (owned by NS, served by the FEC)</li> <li>– Miami/Fort Lauderdale, FL (owned and served by the FEC)</li> <li>– Council Bluffs, IA (owned and served by the IAIS)</li> </ul>             These terminals are all currently served by UP or NS as part of existing commercial agreements           </li> <li>• Intermodal markets that only have terminals serving the international segment are generally not available for diversion growth             <ul style="list-style-type: none"> <li>– UP Phoenix, AZ, currently used for international intermodal service from the Ports of Los Angeles and Long Beach, was not considered for domestic intermodal due to a small capacity footprint; the Phoenix, AZ market can be accessed from Wilmot (Tucson), AZ</li> <li>– All on-dock and port controlled terminals were excluded</li> <li>– Exception: NS Charleston, SC was included as a feasible domestic intermodal market, even though today it only handles international freight, since it is owned/operated by NS</li> </ul> </li> <li>• Idle NS terminals at McCalla, AL (Birmingham, AL intermodal market) and Greencastle, PA (Baltimore-Washington-Northern Virginia intermodal market) were made available for diversion traffic, as these can be reopened to add capacity and serve these markets effectively</li> <li>• No new greenfield terminals on either railroad were considered</li> </ul> |
| <b>Terminal capacity:</b> There must be sufficient terminal capacity or a reasonable expansion plan for growth lanes, and if not, then only        | <ul style="list-style-type: none"> <li>• Traffic was capped at the current stretch capacity for the Twin Cities Intermodal Terminal (Minneapolis, MN), Denver, CO on UP and Buffalo, NY on NS because these cannot be expanded to capture all potential growth with the current footprint</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |

<sup>63</sup> “Headhaul” refers to the primary direction that loaded freight is moving (i.e., higher loaded volume). “Backhaul” is the return journey of empty or loaded containers.

| Criterion                                                                                                                                         | Comments                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|---------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| the highest volume lanes divert until the terminal is full                                                                                        | <ul style="list-style-type: none"> <li>• New domestic lanes to Huntsville, AL were restricted to just Los Angeles, CA due to uncertainty over maximum throughput capacity for a domestic intermodal product at a terminal owned by a third party</li> <li>• In specific multi-terminal markets, lanes were rearranged between terminals or idle terminals reactivated to ensure all the growth could be handled</li> <li>• All other intermodal markets where volumes exceed capacity have the potential for terminal expansion, which was confirmed during meetings with UP and NS terminal capacity and operations experts</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Train service:</b> There must be a feasible routing plan using intermodal trains that is able to offer competitive transit times <sup>64</sup> | <ul style="list-style-type: none"> <li>• After review with service design teams, all lanes for Texas to/from Huntsville, AL and Louisville, KY (Appliance Park) were excluded, because the intermodal train plan and mainline network only offer circuitous routes via Atlanta, which would have uncompetitive transit times with truck</li> <li>• Service from Lathrop, CA, Texas and Tacsim, WA to the Northeast was directed to specific terminals based on the train plan (e.g., Tacsim-Global 2-Morrisville and excluding Tacsim-Global 2-Croxtan, which would require extra handling) which keeps lifts within capacity at Morrisville, PA</li> <li>• New lanes from Twin Cities Intermodal Terminal (Minneapolis, MN) to eastern destinations had to be competitive without operating through Wisconsin <ul style="list-style-type: none"> <li>– The shortest route goes via Wisconsin and Chicago, IL and the infrastructure currently only permits single-stack intermodal operation</li> <li>– Service Design developed a feasible routing with double-stack clearance that, while it adds some circuitry, is still expected to achieve truck-competitive transit times for lower priority freight</li> <li>– Routes to New England and the Northeast were excluded from consideration, given the circuitry for the route that avoids Wisconsin</li> </ul> </li> </ul> |

These operational considerations were applied in two stages. After calculating the theoretical intermodal traffic at the everywhere-to-everywhere stage, where linehaul rail is set to be available between any two terminals, the lanes were down-selected based on sufficient traffic density and the availability of UP-NS terminals at both origin and destination. Lanes which either had existing service or unserved lanes that met the criteria and gain improved linehaul rail service post-merger were carried forward to the next stage as future-state lanes.

After this screening stage, the drayage model was run a third time to assign intermodal addressable trucking to future-state lanes. Once the lookalike segmentation model was applied to

<sup>64</sup> All lane-specific exclusions and inclusions to line up with planned train service are included in the workpaper “truck\_to\_im\_vFinal.py.”

serviceable trucking in those lanes, the operational criteria were applied again to confirm that there was sufficient volume from all traffic sources (existing, rail-to-rail, long-haul drayage extended hauls) and UP-NS terminal availability.

Analysis results were iterated with UP-NS service designers to ensure that within a terminal catchment, there was sufficient terminal capacity to handle diverted traffic. This required reorganizing some existing lane-terminal assignments. None of these changes impact the drayage economics for those lanes. This resulted in the elimination of some lanes from Twin Cities Intermodal Terminal (Minneapolis, MN), which cannot be easily expanded.

Finally, Oliver Wyman worked with UP-NS service designers to ensure that the train service to operate each lane was feasible and truck-competitive. This resulted in the elimination of all lanes from Texas to Huntsville, AL.

#### **5.4. Estimated Truck-to-Intermodal Rail Diversions**

When the lookalike segmentation was applied to the addressable market for diversions, this projected that 1,201,000 of the total 2,722,000 identified intermodal-serviceable truckloads in lanes that would see improved rail service are convertible to domestic intermodal units on the post-merger rail network, after all criteria were applied. This is a diversion rate of 44%.

A further 70,000 extended-haul diversions were identified from converting long-haul drayage moves over 250 miles to a longer rail transit across the watershed in two markets: Chicago, IL drayage to Detroit, MI and Toledo, OH; and Memphis, TN drayage to Huntsville, AL. These are discussed in Section 5.5.

**Exhibit 5-4: Estimate of intermodal truckloads removed from roadways due to a UP-NS merger<sup>65</sup>**



Some 78% of truck-miles are in long-haul lanes over 2,000 miles, as shown in Exhibit 5-5, based on the average Transearch truck mileages for those lanes. For longer hauls, door-to-door intermodal can be much closer to truck on transit times than other rail services, particularly once the interchange delay is removed due to single-line service. Thus, longer hauls have the potential to be a source of significant growth. The diversions have an average length of haul of 2,069 door-to-door miles (Exhibit 5-5). This is 24% longer than the average length-of-haul reported by J.B. Hunt, the largest private asset intermodal operator, of 1,673 door-to-door miles in 2023, showing that the mix of lanes is longer-haul than the current-state intermodal.<sup>66</sup> This aligns with the large longer haul growth opportunities from the Ohio Valley and Southeast to/from the West Coast, and from South Texas into the northeast which are underserved today by domestic intermodal.

<sup>65</sup> Map created using TransCAD Transportation Planning Software and Oliver Wyman diversion analysis data; see workpaper "C-Trucks Diverted from Highway vFinal.xlsx."

<sup>66</sup> 2023 J.B. Hunt annual report; see reference source "JB\_Hunt\_2023\_annual\_report\_VF.pdf."

**Exhibit 5-5: Estimated truck-to-rail intermodal diversions by truck length of haul<sup>67</sup>**

| Truck mileage band | Truckloads (thousands) | Truckloads (%) | Truck-miles (millions) | Truck-miles (%) | Average LOH (miles) |
|--------------------|------------------------|----------------|------------------------|-----------------|---------------------|
| 0-500              | n/a                    | n/a            | n/a                    | n/a             | n/a                 |
| 500-1000           | 86                     | 7%             | 68                     | 3%              | 791                 |
| 1000-1500          | 182                    | 15%            | 222                    | 9%              | 1,220               |
| 1500-2000          | 144                    | 12%            | 249                    | 10%             | 1,729               |
| 2000-2500          | 479                    | 40%            | 1,095                  | 44%             | 2,286               |
| 2500+              | 310                    | 26%            | 851                    | 34%             | 2,745               |
| <b>Total</b>       | 1,201                  | 100%           | 2,485                  | 100%            | 2,069               |

No assumption was made to account for any reduction in empty truck-miles. Appropriate intermodal empties to supply containers for diversions were sized and routed during the creation of the Operating Plan. Empty intermodal container traffic was added to serve total domestic intermodal loads on UP-NS, both existing and diversion growth. This fully replaced existing domestic intermodal empty traffic flows to enable the network to take advantage of opportunities to use westbound diversions from the Southeast and Ohio to California to reduce westbound empty repositioning.<sup>68</sup>

The estimate for diverted truck-miles shown in Exhibit 5-5 does not include the reduction in empty truck-miles that conversion to intermodal also would cause. Industry-leading national trucking companies typically achieve 14% empty miles on their irregular route dry van operations.<sup>69</sup> The empty miles percentage is higher for drayage, as empty domestic containers must frequently be repositioned to a shipper for the next load by rail, leading to more drayage miles returning empty containers to the terminal. Thus, the national reduction in truck-miles could be expected to be higher than the numbers calculated just for loads.<sup>70</sup>

<sup>67</sup> See workpaper “C-Trucks Diverted from Highway vFinal.xlsx.”

<sup>68</sup> STB Finance Docket No. 36873, Operating Plan Verified Statement, op. cit.

<sup>69</sup> 2023 Knight Swift annual report (14.3% empty miles) and Werner annual report (14.4%) for irregular route, for-hire trucking; see “Knight\_Swift\_2023\_annual\_report\_VF.pdf” and “Werner\_2023\_annual\_report\_VF.pdf.”

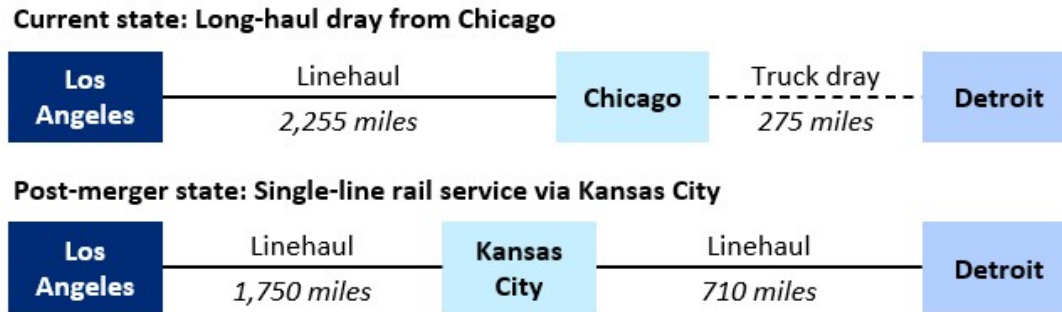
<sup>70</sup> See workpaper “C-Trucks Diverted from Highway vFinal.xlsx.”

## 5.5. Long-Haul Drayage Extended Haul

The addressable opportunity to convert truck traffic to rail intermodal also includes extending the haulage of existing intermodal services, where a long-haul dray over 150 miles is currently required (Exhibit 5-6). There are two geographic markets where this is relevant: drayage from Chicago, IL to Detroit, MI and the northern Ohio region; and drayage from Memphis, TN to Huntsville, AL and northern Alabama.<sup>71</sup> Total addressable intermodal units, based on drayage moves from Transearch, is sized at 175,000 (both directions).<sup>72</sup>

### Exhibit 5-6: Long-haul drayage extended haul diversion opportunity<sup>73</sup>

Example intermodal lane: Los Angeles to Detroit



The linehaul intermodal leg of this long-haul drayage traffic was assumed to be currently split 50:50 between the two western Class I railroads. This traffic was validated with UP subject matter experts, who have detailed data on the true origin/destination ZIP codes for a sizeable percentage of their intermodal traffic. UP internal traffic data was used to assign a true origin/destination in the western US to addressable long-haul drayage traffic. This review concluded that given the lanes in question and that shippers already use intermodal in these lanes, the post-merger addition of single-line service linking terminals closer to the freight could

<sup>71</sup> Chicago, IL to Detroit, MI drayage distance is approximately 284 miles according to Google Maps; Memphis, TN to Huntsville, AL drayage distance is approximately 216 miles according to Google Maps.

<sup>72</sup> See workpaper “HC-Intermodal Diversions Model vFinal.xlsx.”

<sup>73</sup> Mileages from workpaper “HC-Intermodal Diversions Model vFinal.xlsx.”

result in 100% of this traffic switching to an extended haul, where a new direct lane has the traffic density, inclusive of rail-to-rail and truck-to-rail diversions, to be offered. Shippers would benefit from reducing drayage miles and, as a result, their door-to-door cost per shipment.

Based on the other lane criteria (minimum density, viable train service, etc.), diversions are sized at 70,000 long-haul drayage moves to and from the gateway cities switching to extended haul on the merged UP-NS. This analysis is further detailed in Appendix B.3.3E.

## 6. Rail-to-Rail Traffic Diversions

### 6.1. Rail-to-Rail Introduction

A UP-NS merger would create new, more efficient routes for rail shippers, particularly those that ship between the eastern and western United States, and that previously did not have access to a single-line carrier. Using 2023 historic traffic flows as a foundation for this analysis, prepared by CRA by stitching waybill records from all six Class I carriers, and the 2023 STB CCWS, a merged UP-NS would divert an estimated ~206,000 carloads and 261,000 containers annually of existing business that currently moves on other railroads. Extended hauls – that is, traffic currently handled by UP or NS with another carrier in interline service – are estimated to account for 75% of total rail diversions. New traffic accounts for 25% of estimated rail diversions (Exhibit 6-1).

**Exhibit 6-1: Estimated rail-to-rail diversion to UP-NS<sup>74</sup>**

| Service type <sup>75</sup> | Extended haul  | New traffic    | Total cars/units |
|----------------------------|----------------|----------------|------------------|
| General merchandise        | 97,000         | 25,000         | 123,000          |
| Intermodal                 | 181,000        | 79,000         | 261,000          |
| Bulk                       | 28,000         | 3,000          | 31,000           |
| Automotive                 | 43,000         | 10,000         | 53,000           |
| <b>Total</b>               | <b>349,000</b> | <b>118,000</b> | <b>467,000</b>   |

Most of the estimated new traffic on UP-NS would be diverted from CSXT and BNSF. For CSXT, the estimated 225,000 carloads/units diverted represent 4% of the 6.1 million units handled by CSXT in 2023.<sup>76</sup> The estimated 270,000 units diverted from BNSF represent 3.0% of

<sup>74</sup> See Exhibit 2-4.

<sup>75</sup> Service type uses the Board definition found in the STB 2023 Confidential Carload Waybill Sample Reference Guide, March 5, 2025, Railinc, p. 63.

<sup>76</sup> Analysis of Class I Railroads 2023, Association of American Railroads, Line 713.

the 9.0 million units handled by BNSF in 2023.<sup>77</sup> Estimated diversions of carloads and intermodal units from the Class I carriers are shown in Exhibit 6-2.

**Exhibit 6-2: Estimated Class I carriers with the largest loss in cars/units handled, where loss exceeds 1,000 cars/containers annually<sup>78</sup>**

| Carrier | General merchandise | Bulk    | Automotive | Net carload change | Intermodal |
|---------|---------------------|---------|------------|--------------------|------------|
| BNSF    | -41,000             | -19,000 | -26,000    | -86,000            | -184,000   |
| CSXT    | -61,000             | -2,000  | -32,000    | -95,000            | -130,000   |
| CPKC    | -15,000             | -1,000  | 0          | -16,000            | -6,000     |
| CN      | -7,000              | -5,000  | -1,000     | -13,000            | 0          |

No railroad, other than UP-NS, is expected to gain traffic exceeding five cars per day as a result of diversions. Diversions assume no change by other railroads in their service or capacity, and do not rely on any change to be feasible.

**Section 6.2** provides a high-level overview of the traffic diversion modeling approach and modeling assumptions. Further details of the rail-to-rail diversion model are provided in Appendix A. **Section 6.3** breaks out the estimated rail-to-rail diversion results in more detail for each of the four service types.

## 6.2. Approach and Assumptions

### 6.2.1. High-Level Description of Rail-to-Rail Modeling Approach

A traffic diversion model known as a “discrete choice model” was used for this analysis.<sup>79</sup> The model estimates the probability that a shipper selects a rail route (either a single railroad or combination of railroads) based on the characteristics of that route relative to all other competitive routes in the market. When rail industry changes occur, such as with a merger, the

<sup>77</sup> Ibid.

<sup>78</sup> See workpaper “HC-R2R Diversions Haul Carrier vFinal.xlsx.” Note that CPKC encompasses CPRS, KCS, and KCSM diversions.

<sup>79</sup> Discrete Choice Analysis: Theory and Application to Travel Demand, Moshe Ben-Akiva and Steven R. Lerman, MIT Press, 1985, Sections 5.1 “Theory of Multinomial Choice” and 5.2 “The Multinomial Choice Model.”

route characteristics of available routes in some markets will change, thus changing the probability of a shipper selecting a particular route. This change in probabilities is converted into an expected traffic diversion. If there are no changes to the characteristics of any route in a market, then no diversions will occur in that market.

The following definitions are used for this diversion analysis:

- **Market:** a market is defined for the purposes of this analysis as an origin, destination, and service type, where the four Board service types are used (general merchandise, intermodal, bulk, and automotive).
- **Characteristics:** refers to changes in the rail network. For this modeling effort, the characteristics were the route costs (measured as impedance) and the count of railroads in distinct corporate families involved in the move (measured as junction frequency).
- **Impedance:** rail miles plus a miles-equivalent for the impact of each interline junction (interchange) on a route. The miles-equivalent for a junction is set based on the quantity of traffic that passes through the junction, varying between 90 miles (for intermodal run-through lanes) and 650 miles (for low-volume interchanges). This reflects the additional time and complexity cost for an interline handling (see Appendix A.6.4).
- **Junction frequency:** the number of interchanges between railroads that a railcar must undergo to get from its origin to its destination. In effect, this measure reflects the opportunity to use more efficient physical routings due to the merger and the elimination of interchange complexity between the merging railroads.

This specific form of discrete choice model is known as a “multinomial logit model” and is a common method for modeling transportation mode choice.<sup>80</sup> A detailed explanation of the rail-

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<sup>80</sup> Ibid.

to-rail traffic diversion model is provided in Appendix A. The use of impedance and junction frequency to identify the routes most often selected by shippers is consistent with what is seen in the traffic data, as was shown in Exhibit 3-7.

### 6.2.2. Model Assumptions

Traffic diversion outputs are an estimate of how 2023 traffic would likely have moved over the rail network had UP and NS operated as a single railroad. Traffic diversion estimates are not constrained by line, yard, equipment, or other potential capacity constraints at this phase of the process. Capacity is separately addressed in the UP-NS Operating Plan.<sup>81</sup> Key assumptions for the rail-to-rail traffic diversion model are shown in Exhibit 6-3.

#### Exhibit 6-3: Key rail-to-rail traffic diversion model assumptions

See Appendix A for additional details

| Assumption                                                      | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|-----------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Base year for traffic</b>                                    | <ul style="list-style-type: none"> <li>2023 100% waybill traffic file used to calibrate and run the diversion model. This includes full traffic records for UP, NS, BNSF, CN, CPKC, and CSXT, with the CCWS providing traffic for non-Class I railroads<sup>82</sup></li> </ul>                                                                                                                                                                                                                                                                                       |
| <b>Recent industry changes not fully reflected in 2023 data</b> | <ul style="list-style-type: none"> <li>Base 2023 traffic does not include or fully reflect recent industry changes from mergers/acquisitions involving CP-KCS, CSXT-Pan Am,<sup>83</sup> and CN-Iowa Northern, and other network changes such as the BNSF-Montana Rail Link</li> <li>No effort was made to estimate the impact of these mergers/acquisitions independently on changes to the base 2023 traffic</li> <li>These railroad mergers/acquisitions were allowed to compete for traffic as single-line railroads in the pre- and post-merger cases</li> </ul> |
| <b>Modeling by service type</b>                                 | <ul style="list-style-type: none"> <li>Four versions of the traffic diversion model were used to estimate diversions, to subset traffic into the four Board-defined service types of general merchandise, intermodal, bulk, and automotive</li> </ul>                                                                                                                                                                                                                                                                                                                 |
| <b>Market definition and parameters</b>                         | <ul style="list-style-type: none"> <li>Markets defined as origin, destination, and service type</li> <li>Traffic origins and destinations remain fixed; source competition not modeled</li> <li>Only revenue movements diverted</li> </ul>                                                                                                                                                                                                                                                                                                                            |
| <b>Competitive rail routes definition based on BEA/SPLC</b>     | <ul style="list-style-type: none"> <li>Merchandise and bulk were defined as competitive at an SPLC-SPLC level, based on the definitions in the Switching Carrier/Reciprocal Switching ("SCRS") data,<sup>84</sup> which shows if a railroad can access or has reciprocal switching rights at a station</li> </ul>                                                                                                                                                                                                                                                     |

<sup>81</sup> STB Finance Docket No. 36873, Union Pacific Corporation et. al. – Control – Norfolk Southern Corporation et. al., Operating Plan Verified Statement.

<sup>82</sup> A description of how the 2023 traffic base of record was created is provided in Appendix A.2.

<sup>83</sup> Although Springfield Terminal Railways (SCAC = ST) became part of CSXT in its 2022 acquisition of Pan Am Railways, traffic records in 2023 continued to use ST.

<sup>84</sup> The SCRC database is maintained by Railinc, contains all active railroad freight stations, and lists the serving carrier and an indication of whether the station is open to other railroads or closed. If open, the railroads with access are listed (see Appendix A.3).

| Assumption                                                  | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|-------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                             | <ul style="list-style-type: none"> <li>• Intermodal traffic was defined as competitive at a BEA-BEA level, with a small number of adjustments to more accurately reflect real-world competition based on drayage catchment areas.<sup>85</sup> A railroad requires access to an intermodal terminal in the BEA/catchment area. Thus, if a railroad can offer competitive service in both the origin and destination BEA or via interchange, then that railroad can compete for the traffic</li> <li>• Automotive traffic was defined as competitive on an origin SPLC to destination BEA level, where a railroad requires access to the origin SPLC and an automotive ramp in the destination BEA</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Competitive rail traffic based on historical service</b> | <ul style="list-style-type: none"> <li>• Any railroad or combination of railroads historically moving traffic between an origin and destination for a service type were defined as competitive routes in that market</li> <li>• Additionally, railroads (or combinations of railroads) able to provide service between the origin and destination but historically having zero volume were added <ul style="list-style-type: none"> <li>– These rail routes were determined to be competitive if they are not part of an interline move with a carrier able to directly service the customer in the market</li> <li>– The route does not have an impedance that is more than twice the minimum impedance (i.e., lowest impedance route) in the market and impedance or junction frequency that would make it uncompetitive, based on the rules in Section A.5</li> </ul> </li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>Impedance</b>                                            | <ul style="list-style-type: none"> <li>• Total impedance is the final “cost” of a route – calculated from the physical route distance (rail miles) and the assigned cost of interchange(s) in mile-equivalents</li> <li>• All inter-railroad interchanges were assigned a cost (impedance) reflecting the delay and costs of interchanges</li> <li>• Interchange impedances were set to 350, 450, 550, or 650 miles. Historically high-volume interchanges received an impedance of 350, while historically low-volume interchanges received an impedance of 650. (An impedance of 350 can be thought of as a 350-mile additional “cost” to a trip)</li> <li>• Intermodal trains that operate run-through haulage service were given an impedance of 90 miles, reflecting an approx. three-hour delay for crew change and 2023 average reported intermodal train velocity in 49 CFR 1250.<sup>86</sup> These included UP, CPKC, and NS for Meridian Speedway traffic, BNSF-CSXT for traffic to/from Northwest Ohio and Atlanta Fairburn terminals, and CN-INRD for traffic to/from Indianapolis (see Appendix A for full list)</li> <li>• A default interchange impedance of 10,000 was used if no lower impedance interchange could be found. This ensured all traffic could flow through Quantanet</li> <li>• Railroads in the same corporate family have zero-interchange impedance (e.g., the CPKC family of CPRS, KCS, and KCSM)</li> <li>• Post-merger, UP-NS was modeled as a single-line railroad, with no inter-railroad penalties at interchanges</li> </ul> |
| <b>Removed traffic</b>                                      | <ul style="list-style-type: none"> <li>• Some potentially diverted traffic was removed based on discussions with UP and NS personnel. This traffic typically involved long-term contracts by the incumbent railroad or lack of access by UP-NS (see Section 6.3)</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |

<sup>85</sup> See Appendix D.1.

<sup>86</sup> US Code of Federal Regulations, Title 49, Part 1250 Railroad Performance Data Reporting.

### 6.3. Estimated Rail-to-Rail Traffic Diversions by Service Type

#### 6.3.1. General Merchandise Traffic

A merged UP-NS would attract an estimated 123,000 carloads of general merchandise traffic currently moving on other railroads, as shown in Exhibit 6-4. When calculating the impacts on other railroads, each diverted carload counts once for each railroad in the trip, so a BNSF-CSXT interline move would count as a gain of one carload of new traffic for UP-NS and a loss of one carload for each of BNSF and CSXT.

**Exhibit 6-4: Estimated Class I rail-to-rail annual diversion of general merchandise traffic<sup>87</sup>**

| Carrier      | Extended hauls | New traffic from third parties | Total carloads |
|--------------|----------------|--------------------------------|----------------|
| <b>UP-NS</b> | 97,000         | 25,000                         | 123,000        |
| <b>CSXT</b>  | -45,000        | -16,000                        | -61,000        |
| <b>BNSF</b>  | -25,000        | -17,000                        | -41,000        |
| <b>CPKC</b>  | -11,000        | -5,000                         | -15,000        |
| <b>CN</b>    | -6,000         | -2,000                         | -7,000         |

An estimated 74% of traffic projected to be diverted from CSXT would involve an extended haul move on UP-NS. Most of this traffic historically moved over UP-CSXT but would likely shift to a single-line UP-NS route. The remaining 26% of projected diversions from CSXT involve traffic not historically handled by UP or NS, but this traffic moves in lanes where UP and/or NS have historically offered rail service. For BNSF, the majority (61%) of projected diversions likely would also be extended hauls (moving from a BNSF-NS to a UP-NS route), while 39% would be new traffic not previously handled by UP or NS.

A breakout of rail-to-rail diversions by key commodity is provided in Exhibit 6-5. The largest category of diversions is hazardous materials, which account for 23% of the estimated

<sup>87</sup> See workpaper “HC-R2R Diversions Haul Carrier vFinal.xlsx.” and Exhibit 2-4. Note that CPKC encompasses CPRS, KCS, and KCSM diversions. UP-NS gains are less than the losses on other railroads due to multiple counting. For example, a diversion from BNSF-CSXT to UP-NS counts as one carload lost by BNSF and one carload lost by CSXT, but only one carload gained by UP-NS.

rail-to-rail diversion of general merchandise traffic. Over 80% of chemical or allied products diversions are from extended haul moves, where UP or NS currently participates in the move with another carrier. Other top commodities diverted include food and kindred products (20%), primary metal products (12%), and petroleum or coal products (3%).

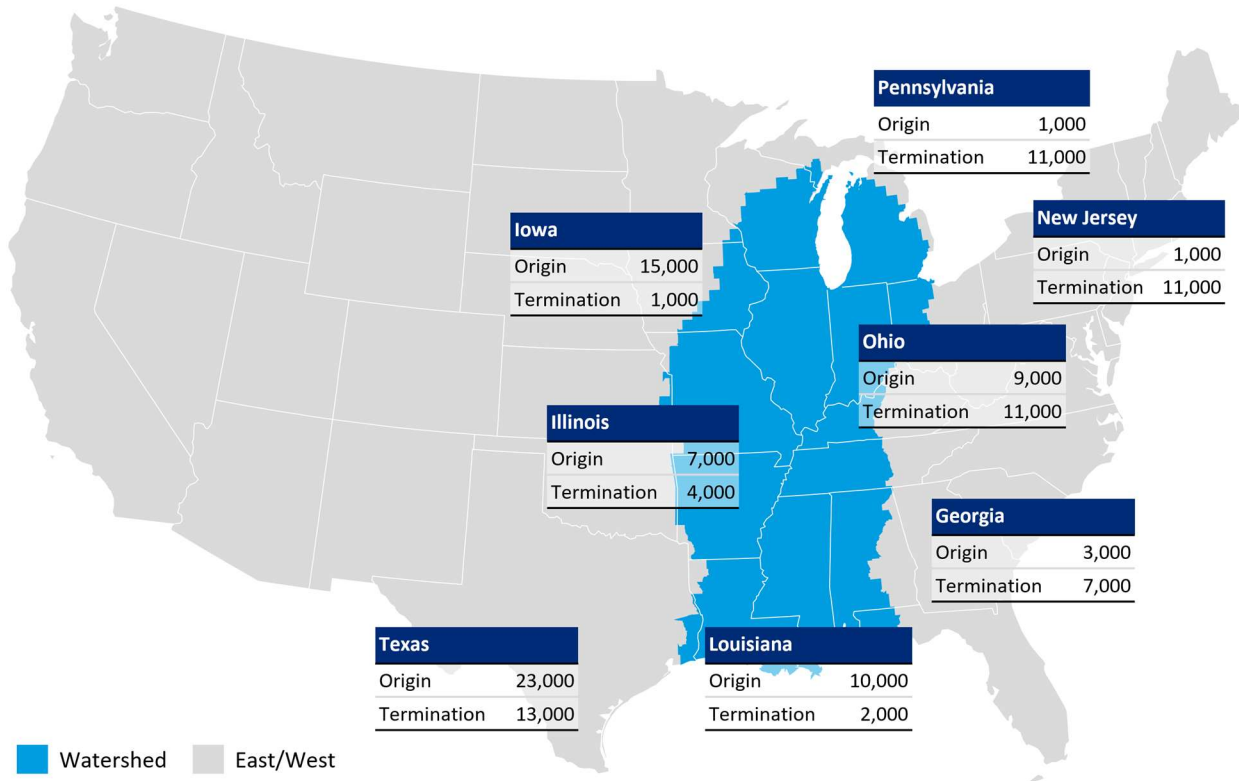
**Exhibit 6-5: Estimated rail-to-rail diversion of general merchandise traffic by key commodity<sup>88</sup>**

| Commodity (STCC2)                                                  | Extended haul | New traffic in existing lanes | Total carloads |
|--------------------------------------------------------------------|---------------|-------------------------------|----------------|
| Hazardous Materials (49)                                           | 23,000        | 4,000                         | 28,000         |
| Chemicals or allied products (28)                                  | 21,000        | 4,000                         | 25,000         |
| Food and kindred products (20)                                     | 20,000        | 4,000                         | 24,000         |
| Primary metal products (33)                                        | 11,000        | 4,000                         | 15,000         |
| Pulp, paper, or allied products (26)                               | 6,000         | 2,000                         | 8,000          |
| Nonmetallic ores, minerals, excluding fuels (14)                   | 3,000         | 1,000                         | 4,000          |
| Clay, concrete, glass, or stone products (32)                      | 3,000         | 1,000                         | 4,000          |
| Petroleum or coal products (29)                                    | 3,000         | 1,000                         | 4,000          |
| Transportation equipment (37)                                      | 3,000         | 1,000                         | 3,000          |
| Lumber or wood products, excluding furniture (24)                  | 2,000         | 1,000                         | 3,000          |
| Waste or scrap materials not identified by producing industry (40) | 1,000         | 1,000                         | 2,000          |
| Farm products (01)                                                 | 1,000         | 1,000                         | 1,000          |
| All other                                                          | 1,000         | 0                             | 1,000          |
| <b>Total</b>                                                       | <b>98,000</b> | <b>25,000</b>                 | <b>123,000</b> |

As shown in Exhibit 6-6, the states that would originate the most general merchandise diversions are Texas, Iowa, Louisiana, Ohio, and Illinois. These five states account for 54% of general merchandise diverted origins. The states with the most terminations of general merchandise diversions are Texas, Pennsylvania, Ohio, New Jersey, and Georgia. The top five terminating states account for 43% of diversions.

<sup>88</sup> See workpaper “HC-R2R Diversions Haul Carrier vFinal.xlsx.”

**Exhibit 6-6: Top originating/terminating states for estimated rail-to-rail diversion of general merchandise traffic<sup>89</sup>**



The top ten state-to-state lanes for estimated diversions of general merchandise traffic are led by the Ohio and Indiana to Texas corridors (Exhibit 6-7). There were no adjustments made to estimated traffic diversions for general merchandise traffic based on reviews with the railroads' commercial teams.

<sup>89</sup> See workpaper "C-Section 6 Exhibits vFinal.xlsx."

**Exhibit 6-7: Top state-to-state lanes and primary commodities for rail-to-rail diversion of general merchandise traffic<sup>90</sup>**

| Lane                   | Estimated carload diversions | Primary commodities                                                                                                                                                |
|------------------------|------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| OH-TX                  | 7,000                        | <ul style="list-style-type: none"> <li>Chemicals or allied products</li> <li>Primary metal products</li> <li>Hazardous materials</li> </ul>                        |
| IN-TX                  | 4,000                        | <ul style="list-style-type: none"> <li>Chemicals or allied products</li> <li>Primary metal products</li> <li>Food and kindred products</li> </ul>                  |
| IA-NJ                  | 3,000                        | <ul style="list-style-type: none"> <li>Hazardous materials</li> <li>Food and kindred products</li> <li>Pulp, paper, or allied products</li> </ul>                  |
| GA-TX                  | 3,000                        | <ul style="list-style-type: none"> <li>Chemicals or allied products</li> <li>Pulp, paper, or allied products</li> <li>Hazardous materials</li> </ul>               |
| AL-TX                  | 3,000                        | <ul style="list-style-type: none"> <li>Primary metal products</li> <li>Chemicals or allied products</li> <li>Hazardous materials</li> </ul>                        |
| IA-PA                  | 3,000                        | <ul style="list-style-type: none"> <li>Hazardous materials</li> <li>Food and kindred products</li> <li>Pulp, paper, or allied products</li> </ul>                  |
| SC-TX                  | 3,000                        | <ul style="list-style-type: none"> <li>Chemicals or allied products</li> <li>Hazardous materials</li> <li>Pulp, paper, or allied products</li> </ul>               |
| CA-OH                  | 3,000                        | <ul style="list-style-type: none"> <li>Primary metal products</li> <li>Food and kindred products</li> <li>Chemicals or allied products</li> </ul>                  |
| PA-WI                  | 3,000                        | <ul style="list-style-type: none"> <li>Nonmetallic ores, minerals, excl. fuels</li> <li>Primary metal products</li> <li>Pulp, paper, or allied products</li> </ul> |
| PA-TX                  | 2,000                        | <ul style="list-style-type: none"> <li>Chemicals or allied products</li> <li>Hazardous materials</li> <li>Primary metal products</li> </ul>                        |
| <b>Top 10 total</b>    | <b>34,000</b>                |                                                                                                                                                                    |
| <b>All other total</b> | <b>89,000</b>                |                                                                                                                                                                    |
| <b>Grand total</b>     | <b>123,000</b>               |                                                                                                                                                                    |

<sup>90</sup> See workpaper “C-Section 6 Exhibits vFinal.xlsx.”

### 6.3.2. Intermodal Traffic

A merged UP-NS would attract an estimated 261,000 intermodal containers currently moving on other railroads, as shown in Exhibit 6-8. When calculating the impacts on other railroads, each diverted container counts once for each railroad in the trip, so a BNSF-CSXT interline move would count as a gain of one unit of new traffic for UP-NS and a loss of one unit for each of BNSF and CSXT.

If a railroad submits revenue empties for private containers as loads, then the model will divert these empties. The model does not, at this stage, seek to balance any flows with empty repositioning. Empties are generated in the UP-NS Operating Plan.<sup>91</sup>

**Exhibit 6-8: Estimated Class I rail-to-rail diversion of intermodal containers<sup>92</sup>**

| Carrier | Extended haul | New traffic | Total intermodal units |
|---------|---------------|-------------|------------------------|
| UP-NS   | 181,000       | 79,000      | 261,000                |
| BNSF    | -104,000      | -80,000     | -184,000               |
| CSXT    | -72,000       | -59,000     | -130,000               |
| CPKC    | -6,000        | 0           | -6,000                 |

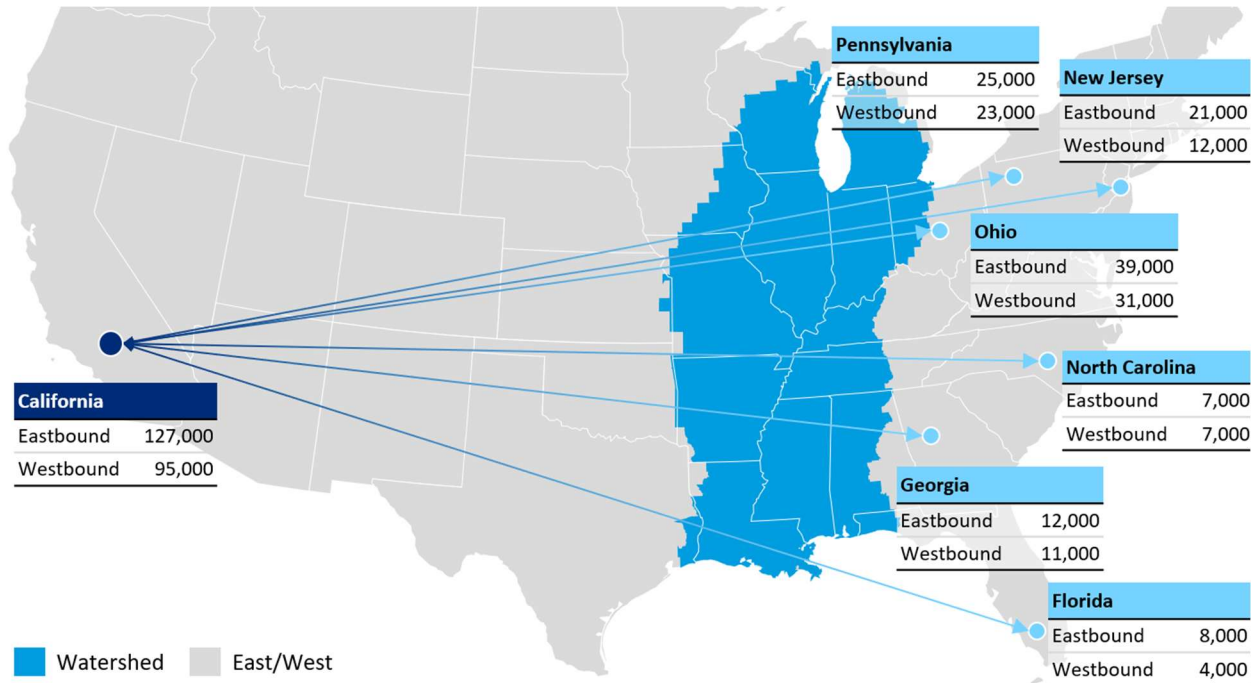
As can be seen in Exhibit 6-9, most of the traffic diversions would involve traffic between California and eastern states. These are lanes where single-line rail service is not currently available and are large, long-haul intermodal flows with existing steel-wheel services and options to rubber-tire interchange in Chicago, IL. The largest diversions would occur in cross-watershed lanes, including intermodal trains added to serve Southern California-Northeast via Kansas City, and Southern California-Southeast via Meridian Speedway routes in the UP-NS

<sup>91</sup> STB Finance Docket No. 36873, Operating Plan Verified Statement, op. cit.

<sup>92</sup> Note that CPKC encompasses CPRS, KCS, and KCSM diversions. See workpaper “HC-R2R Diversions Haul Carrier vFinal.xlsx” and Exhibit 2-4. UP-NS gains are less than the losses on other railroads due to multiple counting. For example, a diversion from BNSF-CSXT to UP-NS counts as one carload lost by BNSF and one lost by CSXT, but only one carload gained by UP-NS.

Optimized Plan. These routes are further enhanced in the UP-NS Growth Plan, where additional new single-line service train pairs are added to serve this traffic.

**Exhibit 6-9: Traffic to/from California accounts for 85% of estimated rail-to-rail intermodal diversions<sup>93</sup>**



Two adjustments were made to the estimated traffic diversions for intermodal containers. First, the estimate of 261,000 diverted containers does not include intermodal diversions between Dallas, TX and the Southeast. This lane was excluded because NS currently has an interline steel-wheel service in this market today over the Meridian Speedway, which will not be improved by the merger. Second, the estimate of 261,000 diverted containers does not include lanes that do not exceed a minimum volume threshold. Unlike merchandise traffic, where a single carload can be shipped between any two stations, intermodal requires that the railroad(s) offer linehaul terminal-to-terminal service. Diversions were allowed only in lanes (for a defined

<sup>93</sup> See workpaper “C-Section 6 Exhibits vFinal.xlsx.” Note that the California eastbound/westbound numbers are for all California traffic and not just the six states listed.

UP-NS terminal to UP-NS terminal), where the total of existing traffic (domestic and international), rail-to-rail diversions, truck-to-rail diversions, and conversion of long-haul drayage to an extended haul in a lane (origin terminal to destination terminal) would be of sufficient density for UP-NS to consider offering intermodal service in the future. This minimum threshold was set at 4,380 units per year, or 12 units per calendar day, which is two articulated 3-well intermodal stack cars per day. See further discussion in Appendix B.3.3.D.

### 6.3.3. Bulk Traffic

A merged UP-NS would attract an estimated 31,000 carloads of bulk traffic currently moving on other railroads, as shown in Exhibit 6-10.

**Exhibit 6-10: Estimated Class I rail-to-rail diversion of bulk traffic<sup>94</sup>**

| Carrier | Extended haul | New traffic | Total carloads |
|---------|---------------|-------------|----------------|
| UP-NS   | 28,000        | 3,000       | 31,000         |
| BNSF    | -17,000       | -2,000      | -19,000        |
| CN      | -4,000        | 0           | -5,000         |
| CSXT    | -1,000        | -1,000      | -2,000         |

A majority of estimated bulk diversions (approximately 90%) would be from extended haul traffic; that is, moves that either UP or NS already participate in pre-merger. The largest projected loss is for BNSF and stems from coal shipments from the Powder River Basin to Michigan and Georgia.

A breakout by commodity for rail-to-rail diversion of bulk traffic is provided in Exhibit 6-11. Coal originating in Wyoming is the primary diverted commodity.

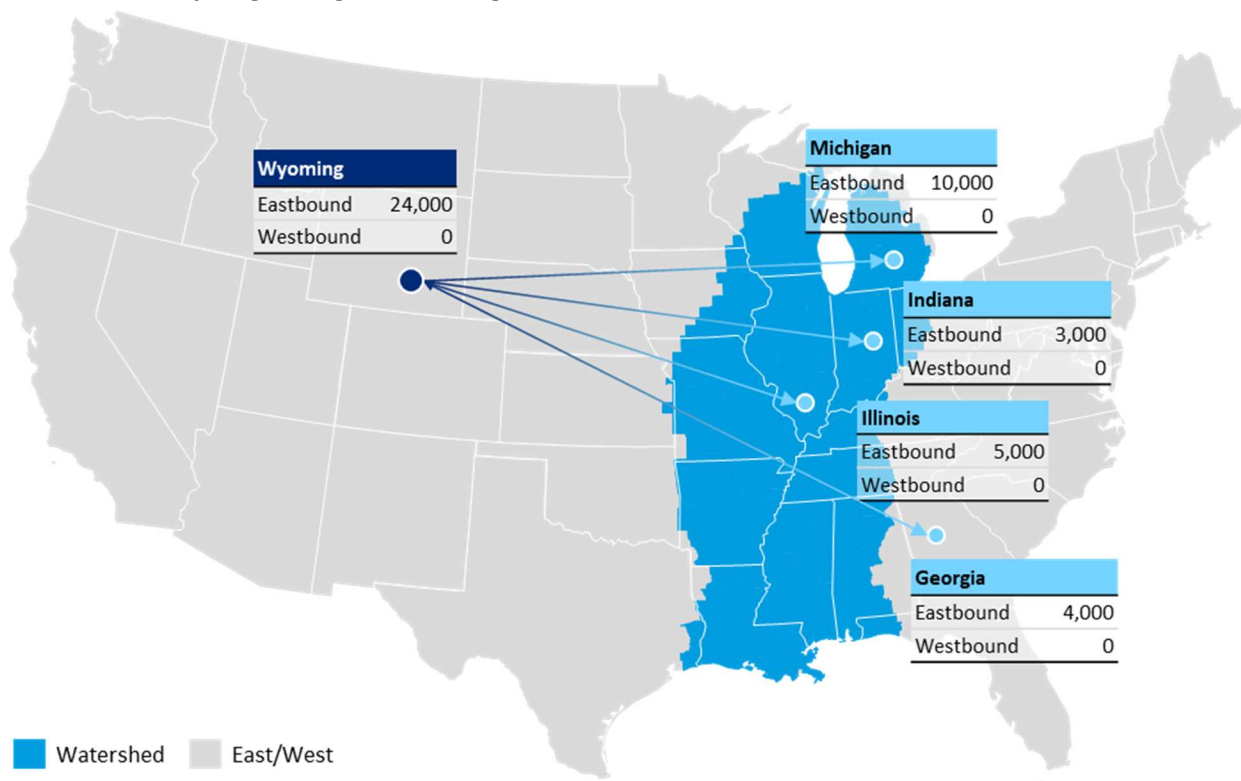
<sup>94</sup> See workpaper “HC-R2R Diversions Haul Carrier vFinal.xlsx” and Exhibit 2-4. UP-NS gains are less than the losses on other railroads due to multiple counting. For example, a diversion from BNSF-CSXT to UP-NS counts as one carload lost by BNSF and one carload lost by CSXT, but only one carload gained by UP-NS. Only carriers where losses exceed 1,000 cars/containers annually are shown.

**Exhibit 6-11: Estimated rail-to-rail diversion of bulk traffic by key commodity<sup>95</sup>**

| Commodity (STCC2)                      | Extended haul | New traffic  | Total carloads |
|----------------------------------------|---------------|--------------|----------------|
| Coal (11)                              | 23,000        | 1,000        | 24,000         |
| Farm products (01)                     | 4,000         | 2,000        | 6,000          |
| <b>Petroleum or coal products (29)</b> | 1,000         | 0            | 1,000          |
| <b>Total</b>                           | <b>28,000</b> | <b>3,000</b> | <b>31,000</b>  |

Exhibit 6-12 shows that 77% of the estimated diversion of bulk traffic would originate in Wyoming. Almost all of this traffic would be delivered to four states, with Michigan and Georgia being states predominantly served by eastern railroads, and Illinois and Indiana being in the watershed region – destinations that currently are inaccessible by the western railroads. In all cases, UP-NS could offer these shippers new single-line rail service where previously it had been unavailable. There were no adjustments made to the estimated traffic diversions for bulk.

**Exhibit 6-12: Top originating/terminating states for estimated rail-to-rail diversion of bulk traffic<sup>96</sup>**



<sup>95</sup> See workpaper “HC-R2R Diversions Haul Carrier vFinal.xlsx.”

<sup>96</sup> See workpaper “C-Section 6 Exhibits vFinal.xlsx” Note that eastbound is for all Wyoming markets, not just the top four shown.

#### 6.3.4. Automotive Traffic<sup>97</sup>

A merged UP-NS would attract an estimated 53,000 carloads of automotive traffic currently moving on other railroads, as shown in Exhibit 6-13.

**Exhibit 6-13: Estimated rail-to-rail diversion of automotive traffic<sup>98</sup>**

| Carrier      | Extended haul | New traffic | Total carloads |
|--------------|---------------|-------------|----------------|
| <b>UP-NS</b> | 43,000        | 10,000      | 53,000         |
| <b>CSXT</b>  | -22,000       | -10,000     | -32,000        |
| <b>BNSF</b>  | -16,000       | -10,000     | -26,000        |
| <b>CFE</b>   | -4,000        | 0           | -4,000         |
| <b>CN</b>    | -1,000        | 0           | -1,000         |
| <b>LSRC</b>  | 0             | -1,000      | -1,000         |

Over 80% of the estimated diversions would be the result of extended hauls, with the largest portion likely to be diverted from a historic UP-CSXT interline move to a new single-line UP-NS route. The states that would originate the most automotive estimated diversions are Texas, Indiana, California, Michigan, and Oregon (Exhibit 6-14). These five states account for 78% of diverted origins. The states with the most diverted terminations would be Pennsylvania, Arizona, Ohio, California, and Texas. The top five terminating states account for approximately half of diversions.

As described in the Operating Plan Verified Statement, in addition to an improved service product from conversion of interline to single-line service, the railroads intend to rationalize automotive terminals at the Chicago, IL; Kansas City, MO; and St. Louis, MO gateways; and invest in capacity expansion at multiple terminals.<sup>99</sup> Consolidating service to a single location in

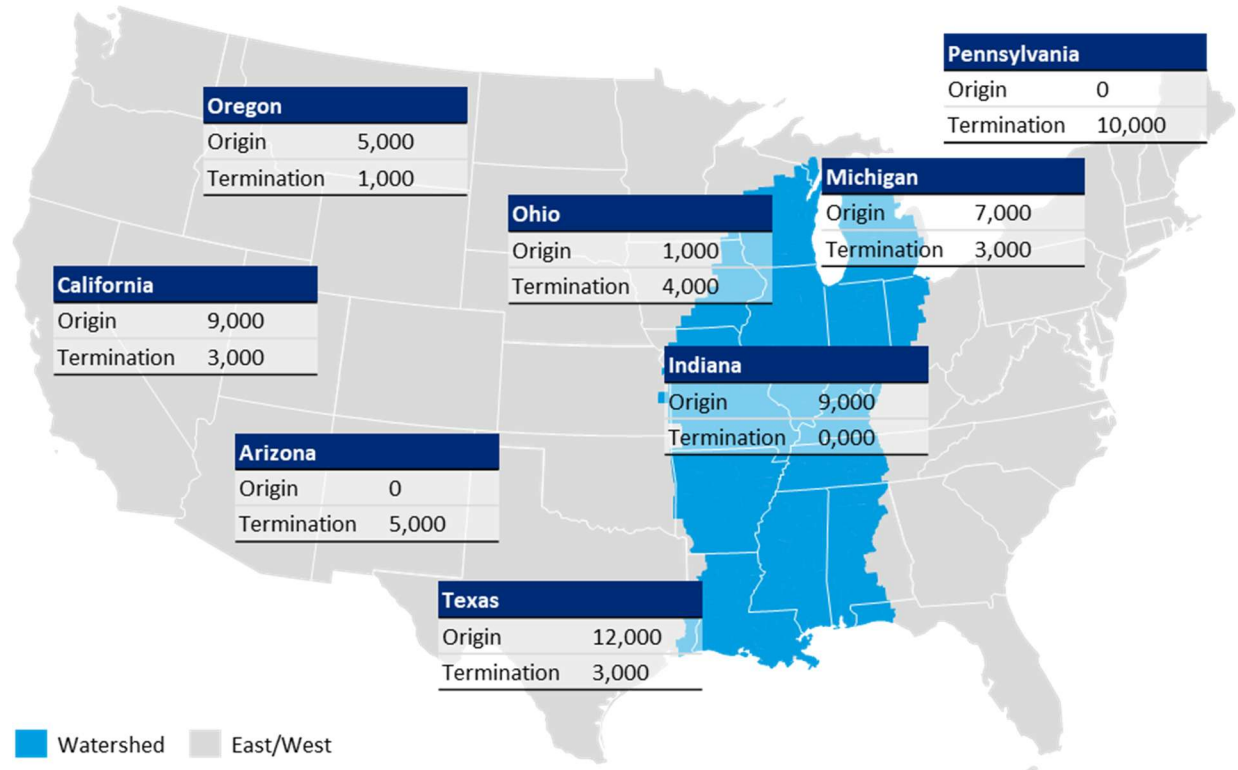
<sup>97</sup> Includes both finished vehicles and parts.

<sup>98</sup> See workpaper “HC-R2R Diversions Haul Carrier vFinal.xlsx” and Exhibit 2-4. UP-NS gains are less than the losses on other railroads due to multiple counting. For example, a diversion from BNSF-CSXT to UP-NS counts as one carload lost by BNSF and one carload lost by CSXT, but only one carload gained by UP-NS. Only carriers where losses exceed 1,000 cars/containers annually are shown. CFE is the Chicago, Fort Wayne & Eastern Railroad (operating in IN/OH) and LSRC is the Lake State Railway (operating in MI).

<sup>99</sup> STB Finance Docket No. 36873, Operating Plan Verified Statement, op. cit.

a metro area generally improves automotive final-mile haul-away economics. OEMs prefer one location in a metro area or region because it builds density for full truckloads to dealerships. The UP-NS Operating Plan also considers optimization opportunities for empty multilevel railcars. The single network creates opportunities to reduce empty miles, improving the competitiveness of the UP-NS automotive offering to OEMs beyond single-line service improvements.

**Exhibit 6-14: Top originating/terminating states for estimated rail-to-rail diversion of automotive traffic<sup>100</sup>**



The top ten state-to-state lanes for estimated diversions of automotive traffic are shown in Exhibit 6-15. The leading corridor for estimated rail-to-rail diversions of automotive traffic would be California to Pennsylvania, followed by Texas to Pennsylvania and Indiana to Arizona.

<sup>100</sup> See workpaper “C-Section 6 Exhibits vFinal.xlsx.”

**Exhibit 6-15: Top state-to-state lanes for rail-to-rail diversion of automotive traffic<sup>101</sup>**

Loaded direction only

| Origin-destination lane | Estimated carload diversions |
|-------------------------|------------------------------|
| CA-PA                   | 6,000                        |
| TX-PA                   | 3,000                        |
| IN-AZ                   | 2,000                        |
| CA-FL                   | 2,000                        |
| MI-TX                   | 2,000                        |
| MI-AR                   | 2,000                        |
| OR-OH                   | 2,000                        |
| SC-AZ                   | 2,000                        |
| OR-MI                   | 1,000                        |
| IN-CA                   | 1,000                        |
| <b>Top 10 total</b>     | <b>23,000</b>                |
| <b>All other</b>        | <b>30,000</b>                |
| <b>Grand total</b>      | <b>53,000</b>                |

## Operational and commercial adjustments

Adjustments were made to remove diversions in the model to locations that, based on Oliver Wyman knowledge and confirmation with subject matter experts at UP and NS, do not have active auto ramps in the area to handle traffic. Any existing auto traffic to/from those BEAs represents either an OEM assembly plant or a private facility. The diversion estimate above has excluded this traffic.

To ensure all existing automotive terminals remain within their loading and unloading capacity, specific diversion lanes to three automotive ramps were reduced, based on review by the railroad service designers and marketing subject matter experts. This ensured that the terminals serving Dallas, TX (Mesquite); Portland, OR (Barnes Yard); and Saint Paul, MN (Western Avenue) remain within their fluid capacity.<sup>102</sup>

<sup>101</sup> Ibid.

<sup>102</sup> The lanes selected for the reduction are based on OEM relationships and other industry factors; these are denoted with the flag column TAKE\_OUT = 'TRUE' in workpaper "table fnl\_2026.r2r\_auto\_final."

## **7. Total Traffic Diversions**

### **7.1. Total Intermodal Diversions**

An estimated total of 1,532,000 diverted intermodal units could result from the UP-NS merger. This includes 1,201,000 truck-to-rail intermodal diversions, 261,000 rail-to-rail intermodal diversions, and 70,000 units from length of haul extensions.

Some rail-to-rail and all long-haul drayage diversions are length of haul extensions, where either UP or NS already serve part of the move. New intermodal traffic movements were generated that reflected the revised origin and destination of these movements. Since a traffic record for each historic, shorter move already existed in the base traffic data, the volume in each historic lane had to be reduced so as to avoid double counting. For example, conversion of a long-haul dray from Memphis, TN to Huntsville, AL, which is part of a trip originating in Southern California, must be offset by reducing the quantity of Southern California – Memphis, TN intermodal units. Intermodal offsets are 181,000 for rail-to-rail and 70,000 for long-haul dray.

The net impact, after removing extended hauls, on UP-NS intermodal traffic would be an increase of 1,280,000 loaded intermodal units compared to the current volume of 7,385,000 intermodal units, a 17% increase. The merger would unlock single-line intermodal service for a number of major freight lanes. These corridors are a key source of traffic growth and split into three categories:

- Existing UP-NS interline intermodal lanes that receive improved service through the removal of interchanges and miles;
- Lanes offered by other railroads as interline, where UP-NS would be able to offer new single-line service; and

- New intermodal lanes that are not currently offered by any railroad.

Existing UP-NS or competitor interline lanes would be 46% of diverted units on 25 lanes, where UP-NS would offer an improvement in terms of the lowest linehaul rail impedance.<sup>103</sup> The criteria to be an existing domestic intermodal lane is at least 12 boxes per day, across all railroad combinations, in at least one direction. The criteria does not distinguish between rubber-tire and steel-wheel interchange. The majority, 259,000, of rail-to-rail and longhaul drayage extended haul diversions are on these lanes as would be expected. In addition, the improvement from interline to single-line is projected to divert 450,000 units onto these lanes from the highway. The largest of these traffic flows is the Southern California to/from the Southeast which uses the Shreveport, LA interchange. Rail linehaul service and reliability would improve by reducing a three-party move today (UP, CPKC, NS) to a two-party move (UP-NS, CPKC) post-merger.

The merger also would enable new shorter haul lanes crossing the watershed. Examples of these include from South Texas to the Southeast and from the Midwest into the Ohio Valley and Northeast. The UP-NS Operating Plan offers 50 new single-line terminal-to-terminal domestic lanes that are not currently offered by any railroads on a single-line or interline basis.<sup>104</sup> These new domestic lanes would account for 54% of total diverted intermodal units. 751,000 units are truck to intermodal diversions, or 62% of all truck to intermodal diversions, are on these new lanes. A further 72,000 domestic intermodal units already move in these lanes as either low volume steel-wheel interchange or are rubber-tire interchanged in Chicago, IL between existing single-line intermodal corridors. Access to the 100% waybill data, including the stitching of rubber-tire interchanges, enabled many lanes to cross the threshold of an average of 12 units per day in at least one direction, enabling UP-NS to open up new intermodal service between more

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<sup>103</sup> See workpaper “HC-Revenue Calculation vFinal.xlsx.”

<sup>104</sup> See workpaper “HC-Intermodal Diversions Model vFinal.xlsx.”

markets (Exhibit 7-1). Achieving scale to offer this terminal-to-terminal linehaul rail service will further reduce the quantity of rubber-tire interchange drayage traffic in Chicago, IL. This was not practical to size given the rail-to-rail diversions and underlying waybill data do not distinguish between a steel-wheel and rubber-tire interchange. The top 15 lanes by revenue are shown in Exhibit 7-2; see the referenced workpaper for the full list of lanes with existing/diverted traffic.

**Exhibit 7-1: Intermodal diversions by lane type<sup>105</sup>**

| Lane type                                        | # of lanes (non-directional) | Truck to intermodal (in thousands) | R2R and long-haul drayage (in thousands) | All diversions (in thousands) | Share       |
|--------------------------------------------------|------------------------------|------------------------------------|------------------------------------------|-------------------------------|-------------|
| Existing domestic intermodal interline available | 25                           | 450                                | 259                                      | 709                           | 46%         |
| New lane                                         | 50                           | 751                                | 72                                       | 823                           | 54%         |
| <b>Total</b>                                     | <b>75</b>                    | <b>1,201</b>                       | <b>331</b>                               | <b>1,532</b>                  | <b>100%</b> |

**Exhibit 7-2: Top 15 state-to-state intermodal lanes by revenue (all diversions)<sup>106</sup>**

Units, unit-miles, and revenue in thousands

| Origin state   | Destination state | Net diversions (units) | Net diversions (unit-miles) | Net diversions (revenue) |
|----------------|-------------------|------------------------|-----------------------------|--------------------------|
| Ohio           | California        | 124                    | 308,246                     | \$227,184                |
| California     | Pennsylvania      | 83                     | 241,711                     | \$160,984                |
| California     | Ohio              | 81                     | 202,499                     | \$149,193                |
| California     | New Jersey        | 80                     | 245,373                     | \$157,412                |
| Texas          | Ohio              | 69                     | 92,550                      | \$101,782                |
| Georgia        | California        | 64                     | 164,248                     | \$119,720                |
| Ohio           | Texas             | 63                     | 81,532                      | \$93,189                 |
| North Carolina | California        | 61                     | 166,515                     | \$117,060                |
| Alabama        | California        | 55                     | 120,356                     | \$97,183                 |
| Pennsylvania   | California        | 51                     | 147,473                     | \$98,637                 |
| Kentucky       | California        | 41                     | 97,561                      | \$74,807                 |
| Texas          | New Jersey        | 40                     | 71,986                      | \$65,230                 |
| Texas          | Pennsylvania      | 35                     | 56,432                      | \$55,844                 |
| California     | Alabama           | 31                     | 68,756                      | \$55,717                 |
| Florida        | California        | 31                     | 90,213                      | \$61,639                 |

<sup>105</sup> Ibid.

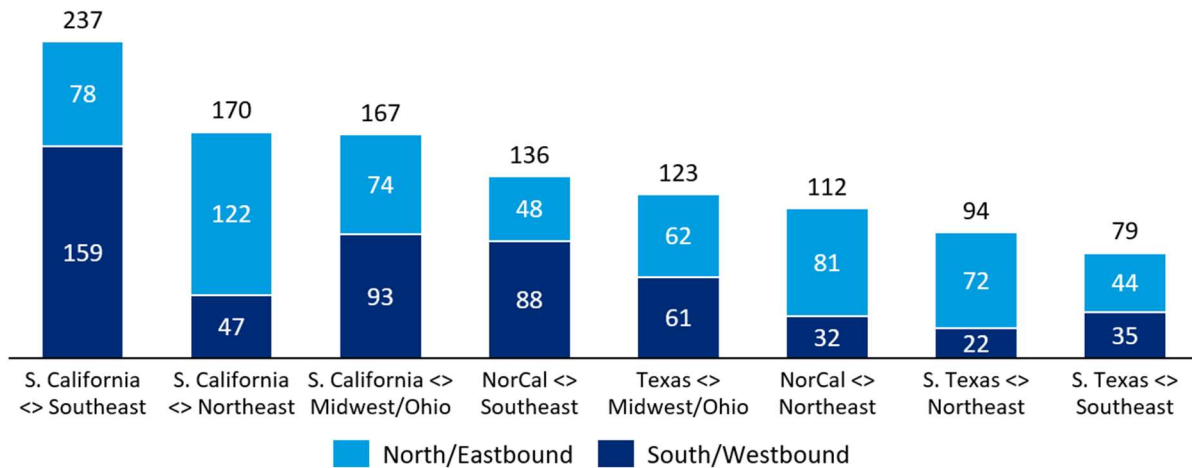
<sup>106</sup> See workpaper “HC-Revenue Calculation vFinal.xlsx.” Includes truck-to-rail, extensions to long-haul dray and rail-to-rail. Top 15 intermodal flows not a source of rail-to-rail revenue offsets.

### 7.1.1. Key Traffic Flows

Approximately 87% of net diverted intermodal traffic (rail-to-rail, truck-to-intermodal, longhaul drayage) falls into eight key traffic flows where there is projected to be sufficient volume to launch new truck-competitive intermodal train service (Exhibit 7-3).

**Exhibit 7-3: Key intermodal lanes where new UP-NS single-line service is planned<sup>107</sup>**

Thousands of diverted units, total = 1,118,000 units



These traffic flows would receive single-line intermodal service, and often direct train service without intermediate handlings in the proposed UP-NS Operating Plan, for the first time. The eight regional traffic flows shown in Exhibit 7-3 will be served by new trains designed in the UP-NS Growth Plan to offer truck-competitive transit times, faster than what can be achieved today. Oliver Wyman worked closely with the railroads' service design team in developing the UP-NS Growth Plan to ensure that train service in these key traffic flows would meet the needs of shippers and be truly truck-competitive. This will be accomplished in each flow as follows:

<sup>107</sup> See workpaper "HC-Intermodal Diversions Model vFinal.xlsx."

- **Southern California – Southeast (Georgia, North Carolina, Florida).** As a single railroad and with projected growth, UP-NS would see sufficient density to consolidate domestic and international traffic in the corridor to go via Shreveport, LA. This would allow for additional daily departures, effectively improving door-to-door transit time (due to reduced schedule delay). The operating teams also expect improved reliability, as Shreveport, LA–Meridian, MS haulage would go from a three-party coordination exercise to two (UP-NS, CPKC).
- **Southern California – Northeast (Pennsylvania and New York-New Jersey).** Shippers currently using existing interline services via Chicago, offered by all Class I railroads, would benefit from new single-line service in two ways:
  - A new direct train service (ZCICX/ZCXCI in the Operating Plan) with no intermediate handlings that crosses from legacy UP to legacy NS in Kansas City, MO, reducing total mileage versus going through existing rail interchange points in Chicago, IL; and
  - The merged railroads will invest in infrastructure neither would be able to justify independently, such as reopening and investing in the NS terminal at E-Rail in New Jersey and upgrading sidings and mainline running speeds between Voltz, MO and Butler, IN on the NS line.

The UP-NS Growth Plan would reduce terminal to terminal transit in these lanes by 17 hours to 95 hours, versus a door-to-door truck transit of 111 hours, enabling a truck plus zero hours to truck plus 24 hours intermodal service offering. In addition, the train will have no intermediate work events between City of Industry in Southern California and Harrisburg, PA, which should result in more reliable transit times than existing interline services.

- **Southern California – Midwest and Ohio Valley.** As a single railroad, UP-NS would be able to efficiently serve these lanes via the Kansas City Gateway. UP-NS would introduce a

new Los Angeles, CA to Detroit, MI train. This also would carry traffic for the Kansas City market. At the NS Voltz, MO terminal, the eastbound train from Los Angeles, CA would split and combine with two existing NS intermodal trains: one that runs daily to Detroit, MI and the other that serves the “W Line” terminals at St. Louis, MO; Louisville, KY; Cincinnati, OH; and Columbus, OH. This would provide a direct single-line intermodal train to Detroit, MI from Southern California for the first time, which will be between truck plus zero hours and truck plus 24 hours, and service to other Ohio Valley markets with a single block swap.

- **Texas – Midwest/Ohio Valley.** Combining UP-NS unlocks viable intermodal lanes between Texas and the Ohio Valley (Louisville, KY; Cincinnati, OH; Columbus, OH). Interline service is not currently competitive with truck because of the interchange delay and the short hauls on one or both legs of the trip. The merger would enable new intermodal lanes from southern Texas (Houston and Laredo) via the New Orleans gateway, as there would now be sufficient density to offer this train service in the UP-NS Growth Plan when combined with traffic to the Southeast and Northeast.
- **Northern California – Northeast.** With truck-to-rail diversions, there would be sufficient demand to introduce a new intermodal train pair between Lathrop, CA and Croxton, NJ that would bypass Chicago, IL. This removes intermediate handlings required in the UP-NS Optimized Plan. The new train has no planned work event in Chicago. The planned terminal-to-terminal transit time end-to-end is 83 hours eastbound, 20 hours faster than solo driver truck transit time. This would provide shippers with intermodal service between solo driver truck transit time plus zero hours and truck plus 24 hours. The train also would serve Toledo, OH and Harrisburg, PA.

- **Northern California – Southeast/Ohio Valley.** Projected growth would allow the introduction of new direct service in both directions between Lathrop, CA and Charlotte, NC via the St. Louis gateway. With intermediate work events at Louisville, KY and Atlanta, GA, this avoids intermediate handlings of this traffic in Southern California, Kansas City, or Atlanta, reducing transit time from Northern California to Charlotte, NC to 108 hours by plan and bringing it to on par with solo driver truck transit time.
- **South Texas – Northeast and Southeast.** These would be new lanes that have not been offered before on a single-line basis. Houston to Atlanta and the Southeast is only 800 miles, making it challenging to offer on an interline basis. There is sufficient demand from diversions for two new train pairs in the UP-NS Growth Plan via New Orleans between South Texas (Port Laredo and Houston) and Atlanta, with one continuing to Croxton, NJ. Both would be able to offer a planned schedule of truck plus 24 hours for door-to-door intermodal service. The new train from Laredo, TX to Croxton, NJ would provide, for the first time, direct intermodal rail service without intermediate handlings between the Mexican border crossing and key East Coast distribution hubs (Atlanta, GA; Charlotte, NC; Harrisburg, PA; and New Jersey). This is a significant improvement on existing interline alternatives, typically involving rubber-tire interchange in Chicago, IL.

These trains were developed by the railroads' service designers to meet the needs of identified intermodal growth. They are described here to illustrate that the UP-NS Growth Plan could execute truly truck-competitive or truck plus 24 hours door-to-door transit times in these key lanes.

Planned terminal-to-terminal transit times are shown in Exhibit 7-4, compared with door-to-door solo truck transits. Depending on the exact schedules and shipper locations, adding 18-36

hours to terminal-to-terminal rail transits yields an approximate door-to-door transit for intermodal to account for drayage, loading, and unloading. All proposed services would provide a truck plus 24 hours intermodal door-to-door transit time.

**Exhibit 7-4: Key planned UP-NS intermodal service transit time improvements (linehaul terminal-terminal) compared to trucks (door-door, solo driver)<sup>108</sup>**

Note: add 18-36 hours to the rail linehaul terminal-to-terminal hours to get door-to-door intermodal transit

**Eastbound**

| Train symbol | Origin                         | Destination  | Gateway     | Total current hours | Total Plan hours | Improve-ment (hours) | Highway mileage | Truck transit hours |
|--------------|--------------------------------|--------------|-------------|---------------------|------------------|----------------------|-----------------|---------------------|
| ZLCCX        | LATC <sup>109</sup>            | Croxtan      | Kansas City | 112                 | 95               | 17                   | 2,785           | 111                 |
| ZLBAT        | Long Beach ICTF <sup>110</sup> | Atlanta      | Shreveport  | 144                 | 74               | 70                   | 2,194           | 78                  |
| ZLTCX        | Lathrop                        | Croxtan      | Chicago     |                     | 83               | New                  | 2,897           | 113                 |
| ZCICX        | City of Industry               | Croxtan      | Kansas City |                     | 95               | New                  | 2,770           | 110                 |
| ZLCDT        | LATC                           | Livernois    | Kansas City |                     | 73               | New                  | 2,275           | 90                  |
| ZIEJX        | IEIT <sup>111</sup>            | Jacksonville | Shreveport  |                     | 83               | New                  | 2,378           | 92                  |
| ZMXCX        | Mexico                         | Croxtan      | New Orleans |                     | 85               | New                  | 1,995           | 74                  |
| ZHOAT        | Houston                        | Atlanta      | New Orleans |                     | 39               | New                  | 810             | 29                  |
| ZLTCT        | Lathrop                        | Charlotte    | St Louis    |                     | 109              | New                  | 2659            | 108                 |

<sup>108</sup> STB Finance Docket No. 36873, Operating Plan Verified Statement, op. cit. Current and planned transit times are sourced from the UP-NS Operating Plan, highway mileage based on Google Maps, truck transit hours based on assumptions detailed in Appendix B.10. Truck transit times estimated based on Google Maps mileages and applying the Federal Motor Carrier Safety Administration's hours of service regulations to a solo driver. The Operating Plan has additional incremental intermodal train starts to handle the growth traffic not shown here.

<sup>109</sup> Los Angeles Transportation Center Intermodal Terminal, operated by UP.

<sup>110</sup> Long Beach Intermodal Container Transfer Facility, operated by UP.

<sup>111</sup> Inland Empire Intermodal Terminal, operated by UP in Southern California.

**Westbound**

| Train symbol | Origin     | Destination      | Gateway     | Total current hours | Total Plan hours | Improve-ment (hours) | Highway mileage | Truck transit hours |
|--------------|------------|------------------|-------------|---------------------|------------------|----------------------|-----------------|---------------------|
| ZHBLC        | Harrisburg | LATC             | Kansas City | 112                 | 93               | 19                   | 2,617           | 97                  |
| ZCTLB        | Charlotte  | Long Beach ITCF  | Shreveport  | 179                 | 83               | 95                   | 2,462           | 94                  |
| ZCXLT        | Croxtan    | Lathrop          | Chicago     |                     | 85               | New                  | 2,910           | 114                 |
| ZCXCI        | Croxtan    | City of Industry | Kansas City |                     | 99               | New                  | 2,757           | 110                 |
| ZDTLC        | Livernois  | LATC             | Kansas City |                     | 80               | New                  | 2,273           | 90                  |
| ZCTLB        | Charlotte  | Long Beach ITCF  | Shreveport  |                     | 83               | New                  | 2,462           | 94                  |
| ZCXMV        | Croxtan    | Mexico           | New Orleans |                     | 83               | New                  | 1,998           | 74                  |
| ZATHO        | Atlanta    | Houston          | New Orleans |                     | 36               | New                  | 807             | 29                  |
| ZCTLT        | Charlotte  | Lathrop          | St Louis    |                     | 108              | New                  | 2659            | 108                 |

## 7.2. Total Carload Diversions

UP-NS is projected to attract a total of 402,500 carloads of traffic, with 344,600 in merchandise/bulk traffic and another 57,900 in multilevels hauling finished vehicles. Of the 344,600 merchandise/bulk total, 153,200 carloads are due to rail-to-rail diversions, both new traffic and extended hauls on existing UP and/or NS traffic, while the remaining 191,300 carloads are diverted from trucks (see Exhibit 2-4).<sup>112</sup> The 153,200 diverted rail-to-rail carloads consists of 122,500 merchandise and 30,700 bulk carloads.<sup>113</sup>

As a practical measure for modeling the Operating Plan, the rail-to-rail merchandise/bulk diversions were compressed from 16,000 lanes to 2,200 (loaded) lanes to remove flows with less than 10 cars/year. The algorithm then readjusts the remaining lanes to keep the same car count. The truck-to-rail diversions were compressed from 153,000 lanes to 2,000 (loaded) lanes. Care was taken to ensure that each STCC2 has traffic in origin-destination lanes based on their largest

<sup>112</sup> See Exhibit 2-4.

<sup>113</sup> During the process of identifying extended haul traffic, almost 12,000 diversions needed to be relabeled from merchandise to bulk, and that is reflected in the car counts here.

diversion flows. For truck-to-rail, the adjustment was made based on maintaining car-miles, and the number of cars increased by 400 due to forcing the same number of car-miles. Thus, the UP-NS Operating Plan shows 346,100 diverted merchandise/bulk cars.

A merged UP-NS network would open new direct rail service for shippers wanting to move goods between states that previously required two railroads for the movement. There are over 100 state-to-state pairs, for example, where total traffic in both directions exceeds 1,000 loaded cars per year. Lanes such as Ohio-Texas, California-New Jersey, Iowa-Pennsylvania, and Minnesota-North Carolina are some of the state pairs where shippers would be able to leverage new single-line rail service. Exhibit 7-5 provides the top 15 state pairs (27% of total diversions); the other 73% of diversions are distributed across many state combinations – an indication of the nationwide benefits shippers could realize from the first US transcontinental railroad.

**Exhibit 7-5: State-to-state carload diversions of rail and truck traffic to UP-NS<sup>114</sup>**

Totals are loaded cars in both directions

| State pairs | Diversions sum of both directions | Cumulative share |
|-------------|-----------------------------------|------------------|
| OH<>TX      | 13,527                            | 3.4%             |
| MI<>WY      | 9,675                             | 5.8%             |
| AL<>TX      | 9,038                             | 8.0%             |
| MI<>TX      | 8,605                             | 10.1%            |
| NJ<>TX      | 8,107                             | 12.2%            |
| IN<>TX      | 7,854                             | 14.1%            |
| GA<>TX      | 7,631                             | 16.0%            |
| CA<>IN      | 6,295                             | 17.6%            |
| CA<>NJ      | 6,224                             | 19.1%            |
| PA<>TX      | 6,211                             | 20.7%            |
| TN<>TX      | 4,885                             | 21.9%            |
| CA<>OH      | 4,855                             | 23.1%            |
| IL<>WY      | 4,646                             | 24.2%            |
| IA<>OH      | 4,584                             | 25.4%            |
| SC<>TX      | 4,575                             | 26.5%            |

<sup>114</sup> Cumulative percentage based on total of 402,500 diverted carloads. See workpaper “C-Section 7 Exhibits vFinal.xlsx.”

A small sampling of industries that could be expected to benefit from a combined UP-NS system include:

- Food products shippers utilizing faster, direct rail service from producing states like Iowa, Nebraska, and California to move products to US Northeast/Southeast consumers;
- Chemical manufacturers moving products from the Chemical Coast in Southeast Texas/Southwest Louisiana to Ohio, Pennsylvania, and Georgia;
- Petroleum refineries in Texas and Louisiana moving product to the US Northeast/Southeast;
- Non-metallic minerals shippers moving product from Wisconsin to Ohio/North Carolina; and
- Lumber producers moving products from Arkansas to Virginia/Georgia.

## **8. Revenue**

### **8.1. UP-NS Revenues From Diversion Traffic**

Revenue was calculated after estimated rail-to-rail, truck-to-rail, and intermodal long-haul drayage diversion traffic had been consolidated and processed for the UP-NS Operating Plan. (See Appendix C for details.) During the traffic compression process, specific merchandise rail-to-rail diversions were reclassified as bulk rail-to-rail diversions because those commodities, in those corridors, currently move in unit trains. This is reflected in the revenue calculations, as bulk pricing is different from carload. This affects approximately 11,500 merchandise rail-to-rail diversions.

To estimate diversion revenue, a revenue per ton-mile figure was used, derived from the CCWS based on commodity and junction frequency. The revenue estimate is inclusive of fuel surcharges and adjusted for length-of-haul, for loads as reported in the CCWS “Total Revenue” field. An adjustment was made using the STB Freight Commodity Statistics (“FCS”) report to correct for the CCWS, which includes a mixture of contract and tariff rates that can lead to a slight overstatement of revenues.

Revenue per ton-mile was multiplied by the miles that traffic would travel on the UP-NS network for each route, as calculated in the UP-NS Operating Plan, using the shortest path distance from MultiRail. Any pre-existing revenue that would be offset as a result of extended haul rail-to-rail or long-haul drayage diversions was then subtracted. Appendix C.2 provides full details on this calculation.

Traffic was “compressed” so that the long tail of low-volume carload diversion lanes could be effectively modeled. The compression methodology took the largest lanes by STCC2 as

representative traffic flows and adjusted the number of cars in a diversion lane to keep the total car-miles from carload diversions the same.

The expected revenue impact is shown in Exhibit 8-1. Diverted traffic is estimated to generate \$4.0 billion in revenue, with more than half (approximately \$2.3 billion) coming from intermodal diversions. Overall, the primary contributor to revenue uplift is diversion from trucks, which is anticipated to account for 85% of total new revenue.<sup>115</sup>

**Exhibit 8-1: Total diversion revenue estimate<sup>116</sup>**

Millions

| Service type             | Rail-to-rail   | Truck-to-rail  | Long-haul drayage | Offsets          | Net revenue    |
|--------------------------|----------------|----------------|-------------------|------------------|----------------|
| Merchandise              | \$628          | \$1,280        | \$0               | (\$415)          | \$1,494        |
| Intermodal               | \$481          | \$2,110        | \$119             | (\$375)          | \$2,334        |
| Bulk                     | \$177          | \$0            | \$0               | (\$114)          | \$63           |
| Automotive (multilevels) | \$239          | \$22           | \$0               | (\$126)          | \$135          |
| <b>Total</b>             | <b>\$1,525</b> | <b>\$3,412</b> | <b>\$119</b>      | <b>(\$1,029)</b> | <b>\$4,027</b> |

## 8.2. Shipper Cost Benefits from Truck-to-Rail Diversions

The diversion of truck shipments to the single-line service enabled by the merger means that shippers which currently move freight by truck could reduce their out-of-pocket transportation costs by approximately \$3.5 billion annually.<sup>117</sup> This cost savings represents a significant, quantifiable affordability benefit for US customers (based on 2023 market prices).

At its core, the \$3.5 billion in annual cost savings is the result of simple math: higher truck costs are replaced by lower rail costs, due to a projected shift of approximately 2.1 million long-haul truckloads, representing 3.6 billion truck-miles, to rail service on the combined UP-NS network.

<sup>115</sup> \$3,412 million truck-to-rail / (\$3,412 million truck-to-rail + \$1,525 million rail-to-rail + \$119 million long-haul drayage – \$1,029 million offsets).

<sup>116</sup> See workpaper “HC-Revenue Calculation vFinal.xlsx.”

<sup>117</sup> See work paper “market\_shares\_enhanced\_transearch\_full\_T2R\_vF.sql.”

On a gross basis, these truck-to-rail diversions would reduce shipper spending on long-haul trucking by an estimated \$7.2 billion per year. Shippers would incur approximately \$3.4 billion in replacement costs for rail linehaul and \$0.4 billion for first- and last-mile intermodal drayage trucking (a net change of \$6.8 billion for the trucking industry), yielding a net reduction of \$3.5 billion in total transportation expenses.<sup>118</sup>

From a shipper’s perspective, the economics are straightforward. Moving freight by rail on a single railroad is typically cheaper than moving the same goods by truck over a comparable distance. This can be observed directly in the data: for similar commodities traveling similar lengths of haul, shippers consistently pay less when they can use single-line rail service than when they rely on trucking.

Thus, when the shipper compares what it is currently paying to truck its shipments with what the data projects it would pay if those same shipments moved by single-line rail, the difference is the cost savings per load. When those per-shipment savings are applied across the volume of traffic expected to shift from truck to rail as new single-line options become available, the market data projects a total reduction in out-of-pocket transportation costs of approximately \$3.5 billion a year. In plain terms, giving shippers more access to seamless, single-line rail service means fewer costly handoffs, lower overall shipping bills, and \$3.5 billion in annual savings that would otherwise be spent on more expensive truck transportation.

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<sup>118</sup> Drayage costs were calculated using the same lane-specific dataset derived from 2023 DAT rates (Appendix B.7), with truck-to-rail diversions aligned to Transearch trucking flows. Rail linehaul costs were estimated using the methodology described in Section 8.1, including applicable interline mileage, and rely on Quantanet shortest-path distances.

**VERIFICATION**

I, David T. Hunt, declare under penalty of perjury that the foregoing is true and correct.

Further, I certify that I am qualified and authorized to file this statement.

Executed on this 29th day of April, 2026.

A handwritten signature in black ink, appearing to read "David T. Hunt", written in a cursive style.

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David T. Hunt  
Vice President

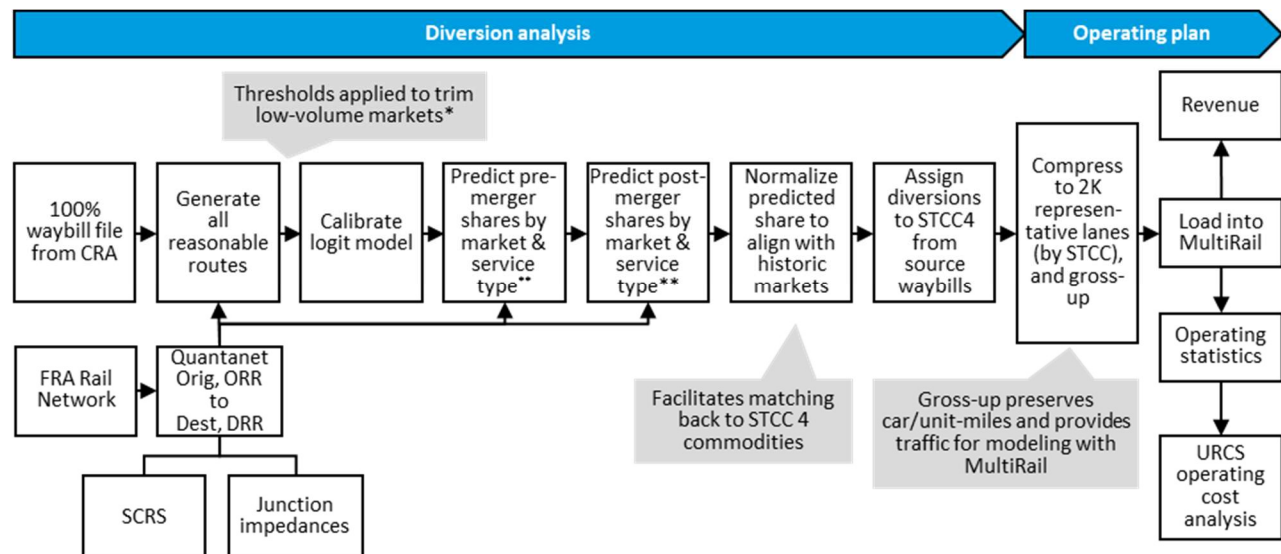
# Appendix A. Oliver Wyman Rail-to-Rail Diversion Model

## A.1. Overview

The elements of Oliver Wyman’s rail-to-rail model appear below in Exhibit A-1 and are described in detail in the following sections. The likely diversion of rail traffic to a combined UP-NS system was estimated by examining the network improvements that the merger could achieve relative to other potential rail options. The key assumptions used in modeling the potential rail-to-rail diversions due to a UP/NS merger are:

- A market is defined as an origin, destination, and service type.
- Impedance<sup>119</sup> and junction frequency<sup>120</sup> are surrogates for price, reliability, and transit time, which are properties that influence shipper route choice selection.

**Exhibit A-1: Oliver Wyman rail-to-rail diversion model overview**



\*Merchandise, Bulk & Auto: <12 cars/year; Intermodal: <12 cars/day.

\*\*Market definitions are based on the following variables: Merch/Bulk: ORR/DRR/OSPLC/DSPLC. Auto: ORR/DRR/OSPLC/DBEA. Intermodal: ORR/DRR/OTG/DTG. See Appendix H: Glossary for acronyms.

<sup>119</sup> Total route impedance = miles + interchange penalties in miles.

<sup>120</sup> The number of interchanges a rail route contains.

## A.2. Rail Traffic Sources

The analysis relied on traffic flows provided by CRA based on 100% waybill data from all six Class I railroads, as well as the 2023 CCWS for non-Class I traffic. CRA’s “stitching together” of these waybill data sources involved two primary steps. First, it corrected for Rule 11 shipments, thus providing the true origin and destination of these moves and giving a more accurate view of the total historical interline traffic.<sup>121</sup> Second, CRA removed all duplicates for moves appearing in more than one of the waybill datasets. The CRA processing is detailed in the Verified Statement of Dr. Elizabeth Bailey.

The data from CRA contained the ultimate origin and ultimate destination (Freight Station Accounting Code (“FSAC”), Standard Carrier Alpha Code (“SCAC”), and SPLC for both origin and destination), commodity (STCC) (both with and without designation), full rail route of the shipment, equipment type (AAR equipment codes with either full four symbol codes or just the first symbol, where full code was unavailable).

Oliver Wyman further enhanced the CRA-provided data by adding traffic parameters, including service type<sup>122</sup> and FIPS and BEA codes for origin and destination (using a SPLC to FIPS/BEA translation table).

For traffic flows with AAR equipment types starting with U (containers), the analysis established if that traffic was a 53-foot domestic container or trailer, or if it was a 20-foot or 40-foot international container. For traffic flows where an AAR equipment code was provided in

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<sup>121</sup> Rule 11, commonly known as the Freight Mandatory Rule, allows railroads to rebill deregulated traffic for quicker revenue settlements and competitiveness. This accounting method, primarily seen in waybills, gives the appearance of local movements while actually indicating long-distance traffic rebilled in key locations like Chicago. The rebilling process can lead to overstated tonnage and carload units, as each rebilled waybill effectively double counts the originating shipment, while understating the length of haul in the data. See 2023 STB Waybill Reference Guide, p. 186 for a complete Rule 11 overview.

<sup>122</sup> Service type was assigned by utilizing service type definitions provided by Railinc. for CCWS – assigning service type 2 (Intermodal) to all flows with AAR equipment type starting with P,Q,S,U,Z; assigning service type 4 (Vehicular flats) to all flows with AAR equipment type starting with V; assigning service type 3 (Bulk) to all flows with specific STCC codes or flows with AAR equipment type starting with C; and assigning service type 1 (Merchandise) to all else.

full (all four symbols), the size of container was established according to the second numeric of the code.<sup>123</sup> For traffic flows where the AAR equipment code was limited to the first symbol, assignment of domestic/international was conducted by calculating ratios of domestic/international containers on a particular route using full waybill data provided by corresponding Class I railroads (where type of container was estimated via specific equipment initials or shipper or consignee names).

For multilevels, traffic flows with AAR equipment types starting with V (vehicular flats), the analysis established if the equipment used was a bilevel or a trilevel platform. For all of this traffic, the AAR equipment code was provided in full (all four symbols) – so the number of levels was established based on the second numeric of the code (footnote Neubauer).

The above data became the traffic file used in the traffic diversion analyses.

### **A.3. Station Master and SCRS Database Creation**

Railinc maintains both a North American Station Master and a Serving Carrier Reciprocal Switching (“SCRS”) database. The former is intended to serve as a comprehensive list of rail stations in North America by FSAC and SCAC. SCRS is a compilation of Customer Identification Files (“CIFs”), which are railroad-provided records of individual shipper agreements at a given facility that dictate access and reciprocal switching rights at a location for a specific shipper. To understand the competitive implications of the merger, a Unified Station Master was generated, with station-level access information where available (Exhibit A-2).<sup>124</sup> In doing so, the stations could be categorized as sole-served, multi-served, or “mixed,” meaning a combination of the two, based on shipping agreements. Ultimately, this file provides a

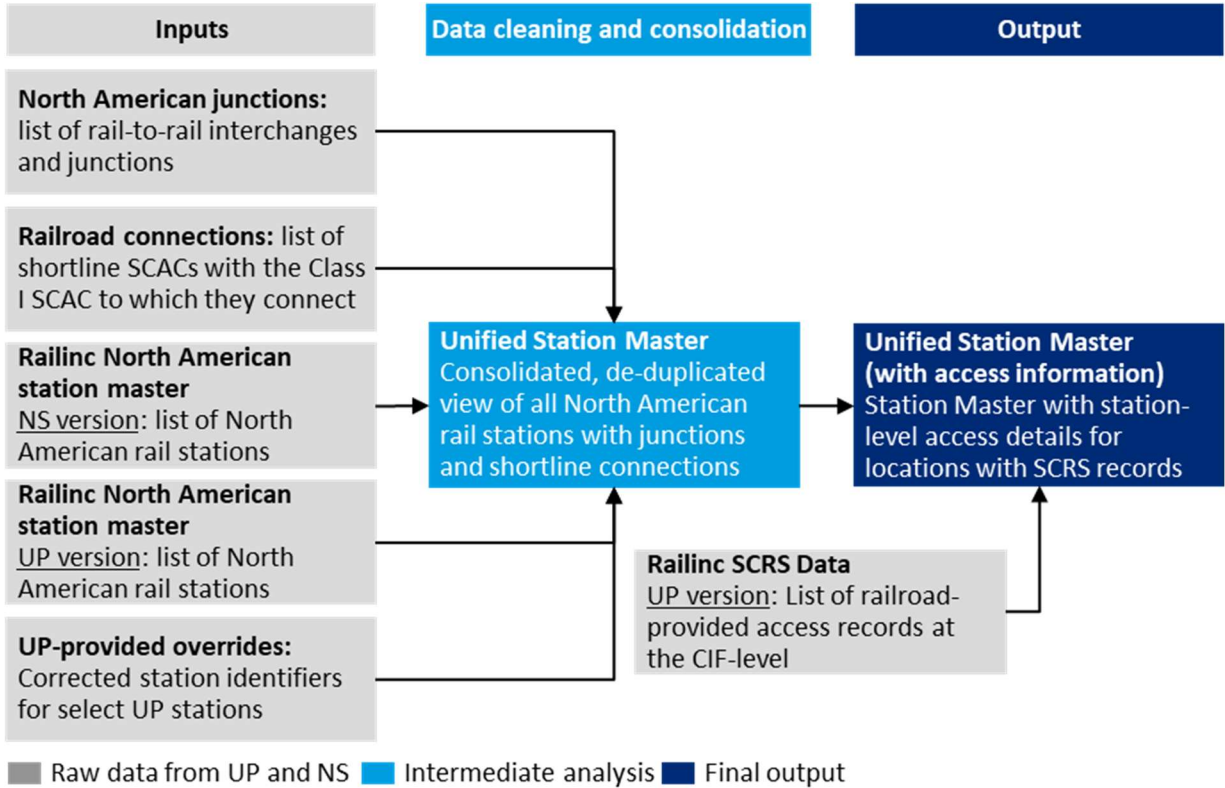
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<sup>123</sup> Neubauer, Eric A. "Guide to Car Type Codes," 2007; see reference source “AAR\_CarType\_Codes.pdf.”

<sup>124</sup> See database table “r2r\_2026.stm\_scrs\_na\_w\_splc\_and\_333.”

framework for identifying where the competitive landscape could theoretically shift in a post-merger state.

**Exhibit A-2: Unified station access master database creation**



To create a comprehensive Unified Station Master, the NS and UP versions of Railinc’s North American Station Master, provided by NS and UP, were aggregated and deduplicated, including OpSta (NS) and CIRC 7 (UP) codes where available. Some stations in the input data are no longer in service or had no traffic in 2023, meaning there are more locations in the consolidated Station Master than appear in the 2023 waybills from NS and UP.

To add access information at a given station, Railinc’s SCRS data, provided by UP, was mapped to assign an access type at each station (open, restricted, local, or closed) based on the

CIFs associated with each station.<sup>125</sup> For stations with multiple CIFs having conflicting access types, a station-level access category of “mixed” was assigned and the constituent CIF access types were listed. For CIFs with conflicting records, the least-restrictive access type for that CIF was used. There are more locations in the consolidated Station Master than in the input SCRS data; these additional stations do not have SCRS access information. For stations with SCRS data available, the list of known accessing carriers beyond the named serving carrier was included.

A list of North American junctions was used to add junction information for applicable stations. A list of railroad connections that indicates to which Class I network a given interline connects also was leveraged, to populate “access via short line” columns for stations where relevant. UP-provided overrides were then applied to update stations with missing or outdated identifiers (i.e., FSAC, latitude/longitude, etc.). Additional columns were derived to identify alternate FSACs for co-located Class I stations at the same customer facility by identifying shared CIFs.

The final output was a Unified Station Master, which is a comprehensive list of North American rail stations with key identifiers and inferred access information based on CIF-level records associated with a given station in the SCRS data when available.

## **A.4. Market Definition**

Markets were defined at either the city (based on SPLC) or Business Economic Areas (“BEA”) level to reflect the physical and commercial drivers of each rail service. Merchandise and bulk (service types 1 and 3) markets are city-to-city<sup>126</sup> to capture local competition and

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<sup>125</sup> “Open” is open to reciprocal switching; “Restricted” is conditionally open under specified conditions or only for selected commodities; “Local” is only one carrier serves a location that is not within the switch limits of another station served by multiple carriers; and “Closed” is closed to reciprocal switching.

<sup>126</sup> A 6-digit Standard Point Location Code (i.e., SPLC) is used to refer to a city or municipal region.

station access. Automotive (service type 4) markets are city to BEA to reflect plant origins serving broader regional markets, Intermodal (service type 2) markets are BEA to BEA to better represent the broader competitive geographic regions for intermodal origins and destinations. The analysis relied upon the CCWS/PUWS assignment of FSAC-county Federal Information Processing Standards (“FIPS”) to BEA mappings, with adjustments for intermodal.<sup>127</sup>

A 6-digit SPLC was used, which generally represents a city, as the origin and destination locations. Freight stations (i.e., FSACs), representing customer locations or other traffic generators, were aggregated within a SPLC, allowing railroads to compete for traffic. To more accurately reflect competition, the SCRS file was used to identify which FSACs are open or closed, and which railroads have access. Traffic at closed FSACs was not considered for diversion to another railroad at the closed station.

The origin, origin railroad, destination, and destination railroad are referred to as a “quad.” For each unique quad, the route with the minimum cost (impedance) was selected (see Appendix A.6.4). For each origin and destination, the railroads that can serve that location were identified, using the Station Level SCRS Consolidation file for automotive, merchandise, and bulk traffic. For intermodal traffic, which FSACs and SCACs have intermodal service was determined based on the presence of intermodal traffic within the 100% waybill data. For automotive traffic, all FSACs with terminating automotive traffic in a BEA were used to determine which railroads to include in the available quads. Service types follow Board definitions.<sup>128</sup>

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<sup>127</sup> Adjustments are listed within Appendix D.1.

<sup>128</sup> 1 – General Merchandise; 2 – Intermodal; 3 – Bulk, 4 – Automotive.

## A.5. Generation of Feasible Routes

The rail-to-rail diversion model was calibrated and executed on a set of feasible routes based on combinations of railroads serving the origin and destination SPLC. All historical traffic revenue routes were included in the calibration phase.

There also are competitive routes with no historical volume included in the analysis. Incorporating these competitive routes with no historical volume ensures the analysis reflects competitive rail options that existed but were unused for whatever reason in the base year. This approach enables more realistic calibration, since there may be some routes with no volume that have a lower impedance and/or fewer interchanges than the routes selected by the shipper. Also, in the post-merger scenario, it generates competitive UP-NS routes where that railroad combination did not move traffic pre-merger.

Competitive routes with no historical volume that are not viable were eliminated based on the following set of competitiveness criteria:<sup>129</sup>

- Multicarrier routes in intranodal markets (i.e., same SPLC), as no diversions are allowed to occur in the model if the origin and destination locations are identical.
- Multicarrier routes where the origin or termination railroad can offer local service in the market.
- Multicarrier routes where the originating or terminating railroad can offer local service within its railroad family in a market.
- Multicarrier routes whose number of interfamilial junctions is >3 more than the market minimum

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<sup>129</sup> See FD 32549, Verified Statement of Mark Hornung of ALK Associates.

- Multicarrier routes whose number of interfamily junctions is >2 more than the market minimum and 20% greater than the minimum distance
- Multicarrier routes whose number of interfamily junctions is >1 more than the market minimum and 60% greater than the minimum distance
- Multicarrier routes whose number of interfamily junctions == the market minimum and 60% greater than the minimum distance
- All routes that interchange immediately at the start or the end of the movement

These rules are conservative to retain possible competitive routes while eliminating non-competitive combinations.

Railroads with different reporting marks but that are part of the same corporate family were combined into one “family,” so the model calculates junction impedances and competitive routes as if the railroads in a family are a single system (Exhibit A-3).

**Exhibit A-3: Railroad reporting mark combinations<sup>130</sup>**

| Railroad family | Combined reporting marks    |
|-----------------|-----------------------------|
| CN              | CN, CNUS, IANR              |
| CPKC            | CPKC, CPRS, CPUS, KCS, KCSM |
| CSXT            | CSXT, PAS, ST               |
| BNSF            | BNSF, MRL                   |

## A.6. Rail Mileage Calculation

### A.6.1. Overview

To isolate the impacts of the merger on price, reliability, and transit time – properties that influence shipper route choice selection – clear baseline (pre-merger) and a corresponding future state (post-merger) were established. Oliver Wyman’s proprietary software, Quantanet, was used to compute both route mileage and interchange penalties (impedance) across the quads, which

<sup>130</sup> See workpaper “HC-Appendix A Exhibits vFinal.xlsx.”

allows the model to keep routing logic constant across scenarios while varying only the junction impedance assumptions that change under the merger. The cost and service quality, represented by total route impedance and junction frequency, were subsequently used in statistical analyses.

#### **A.6.2. Quantanet Description**

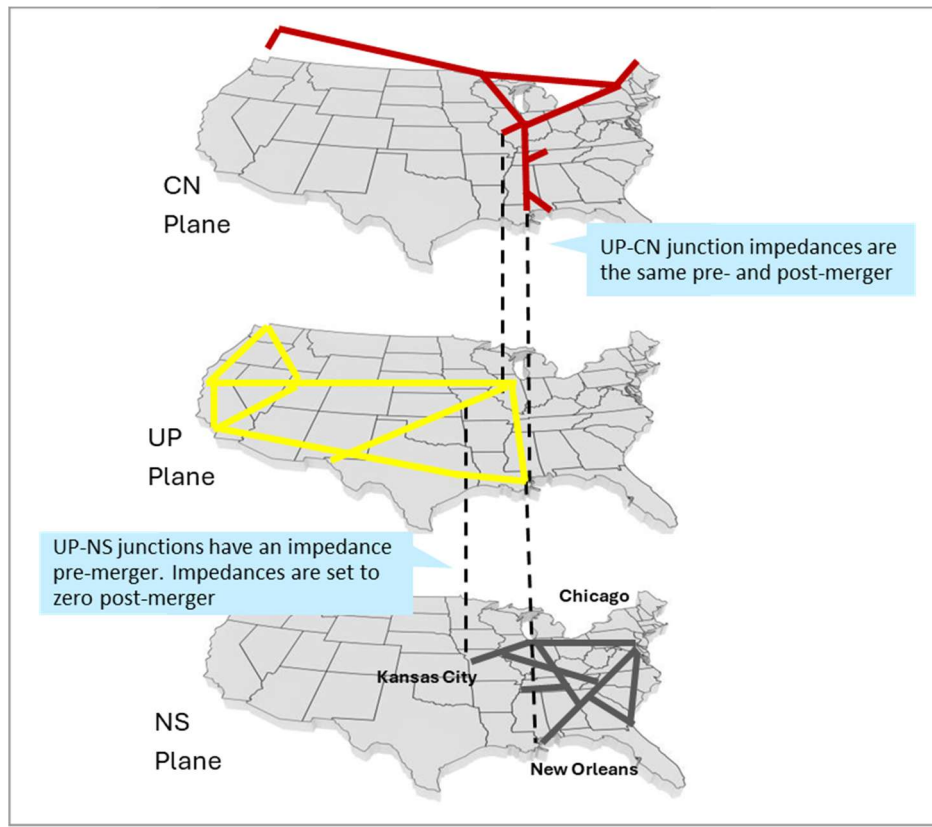
Oliver Wyman's Quantanet uses the Federal Railroad Administration ("FRA") North American Lines and Nodes<sup>131</sup> as the base network in a path-finding software module. Quantanet was used to estimate, for each route in the waybill file, rail miles, total route impedance, and the number of interchanges (Exhibit A-4).

For each origin station and carrier to each destination station and carrier in the rail traffic file described in Appendix A.2, Quantanet calculates the least impeded path between the origin and destination nodes on the network. The least impeded path is the path that minimizes the total impedance.

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<sup>131</sup> FRA nodes represent stations where freight can originate or terminate, while FRA lines represent track segments that one or more railroads can operate under trackage rights.

**Exhibit A-4: Oliver Wyman Quantanet (illustrative)**



### **A.6.3. Geocoding Procedure**

Each rail station, defined as a unique combination of FSAC and SCAC, needs to be assigned (i.e., geocoded) in Quantanet. This is accomplished by selecting the closest FRA node that is served by the specific railroad in the Unified Station Master. Rail stations that cannot find a match within 50 miles of their established location within the Unified Station Master are added to a list of stations that cannot be accurately geocoded. Any generated quads with originating or terminating participation in this list are removed as viable competitive candidates due to bad quality data. This screening removed approximately 3% of merchandise, bulk, and automotive routes, and approximately 2% of intermodal routes, with no impact on volume.

#### A.6.4. Junction Impedances

Junction impedances refer to the impedance assigned to a rail path as a penalty for interchanging. The junction impedances are based on the volume of loaded units per day (Exhibit A-5).

**Exhibit A-5: Junction impedances based on 2023 CCWS interchange volumes<sup>132</sup>**

|                                                                   | Junction impedance<br>(mileage equivalent) | Number of interchanged<br>cars per year |
|-------------------------------------------------------------------|--------------------------------------------|-----------------------------------------|
| No impedance at the interchange                                   | 0                                          | Same family                             |
| <2 loaded units/day                                               | 650                                        | <730                                    |
| 2 to 10 loaded units/day                                          | 550                                        | 730 to <3,650                           |
| 10 to 50 loaded units/day                                         | 450                                        | 3,650 to < 17,800                       |
| >50 loaded units/day                                              | 350                                        | 17,800+                                 |
| Run-through intermodal unit<br>train (specific junctions / lanes) | 90                                         | n/a                                     |

Junction impedance at each interchange was balanced so that all carriers not in the same corporate family receive the same penalty at that location. For example, if pre-transaction volumes imply CN/UP should have an impedance of 350 and CN/BNSF should have 450 at the same location, both were set to 350 to preserve fair competition among carriers.

There are some junctions known to have traffic restrictions. The junction impedance between UP/NS at Shreveport is set to 10,000, to restrict access to non-intermodal traffic interchanging at Shreveport, as this type of interchange is not available today. A separate intermodal junction impedance table was used for intermodal to ensure the model does not create intermodal routes through non-intermodal gateways (e.g., New Orleans, LA did not have a meaningful amount of steel-wheel intermodal interline service in 2023, with services offered via Shreveport, LA and Memphis, TN).

<sup>132</sup> See workpaper “HC-Appendix A Exhibits vFinal.xlsx.”

To model the improvement of rail service before and after the UP/NS merger, junction impedances between the UP and NS were reduced from their pre-merger impedances to 0. Additionally, a 0-impedance junction was added at Sidney, IL to reflect the new possibility of single-line service through that interchange location. This gateway between the legacy UP and legacy NS networks is used in the UP-NS Optimized and Growth Operating Plans to introduce new train service which increases car velocity and bypasses the Chicago gateway, so it is right to introduce it in the post-merger network.<sup>133</sup>

#### **A.6.5. Run-Through Haulage Adjustments for Junction Impedance**

Run-through intermodal trains with haulage agreements operate closer to a crew change than a regular interchange, which is reflected in lower impedance than the standard 350 miles-equivalent for an interchange with >50 loaded units per day. This was set at a 90-mile equivalent, which represents three hours at an average train speed of 30 miles per hour, as a realistic representation of the additional complexity from the handoff. In the future state, one interchange was removed from the Meridian Speedway for traffic via Shreveport, because it changes from three carriers (i.e., UP, NS, CPKC) to two carriers (UP-NS, CPKC) and is a short bridge move. This was validated with both railroads' operations departments.

The following adjustments were made to route impedances to better reflect the penalties of run-through haulage agreements being lower than true interchanges:

- Intermodal
  - The UP-CPKC-NS interchange lanes via Shreveport, LA onto the Meridian Speedway received 180 impedance in the pre-merger case (interchange at Shreveport, LA and

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<sup>133</sup> STB Finance Docket No. 36873, Operating Plan Verified Statement, op. cit.

Meridian, MS), and 90 impedance post-merger (simplified to a UP-CPKC haulage agreement).

- The BNSF-CSXT interchange at Birmingham received 90 impedance in both the pre- and post-cases for the BNSF lanes to/from Atlanta Fairburn and the Southeast.
- All BNSF-CSXT traffic between BNSF's Los Angeles terminals and CSXT's NW Ohio terminal in North Baltimore, OH received 90 impedance.
- The NS-KCS interchange at Meridian received 90 impedance for lanes to/from the Wylie terminal in Dallas, TX.
- All service types: All routes that include NS and Ayer, MA received 90 impedance.

## **A.7. Rail Logit Model**

### **A.7.1. Overview**

A multinomial logit model, a form of logistic regression,<sup>134</sup> was used to estimate the market share a particular route would receive based on the characteristics of total route impedance and junction frequency.

### **A.7.2. Calibration**

The rail-to-rail diversion model was calibrated using the 100% waybill data from the six Class I railroads and the CCWS for non-Class I moves. This data collection of modal characteristics is based on the total route impedance, which is the total rail distance plus any penalties added at interchanges, as well as the number of rail-to-rail interchanges, collected from Quantanet.

Instead of using the absolute values of total route impedance and junction frequency, a market's minimum impedance and its junction frequency were computed, then every route in

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<sup>134</sup> A standard textbook describing the nested logit model is Discrete Choice Analysis: Theory and Application to Travel Demand, op. cit., see Chapter 10.

that market was indexed to those minimums using the formulas below, to ensure that the features of total route impedance and junction frequency are treated equally and on a market-by-market basis. Indices were used because this reflects the percentage difference to the market regardless of the length of haul. The formulas for indexing impedance and junction frequency are as follows:

$$\text{Indexed impedance} = \frac{\text{Total route impedance}}{\text{Market minimum impedance}}$$

$$\text{Indexed junction frequency} = \frac{\text{Route junction frequency} + 1}{\text{Market minimum junction frequency} + 1}$$

With an indexed impedance and indexed junction frequency for every route in every valid market, coefficients alpha ( $\alpha$ ) and beta ( $\beta$ ) were calculated that minimize the sum of square differences between the predicted market shares and the actual market shares. The logit model has the following form:<sup>135</sup>

$$S_i = \frac{e^{-\alpha x_i - \beta y_i}}{\sum_{i=1}^n e^{-\alpha x_i - \beta y_i}}$$

Where:

$S_i$  = Predicted share for route i

$\alpha$  = Calibrated coefficient for indexed impedance

$x$  = Route indexed impedance

$\beta$  = Calibrated coefficient for indexed junction frequency

$y$  = Route indexed junction frequency

$n$  = Number of rail routes in market

The calibration yielded the following coefficients for the execution of the logit model (Exhibit A-6). The alpha (applied to the indexed impedance values) and the beta (applied to the indexed junction frequency values) indicate a decrease in impedance and/or junction frequency

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<sup>135</sup>Discrete Choice Methods with Simulation, Second Edition, Cambridge University Press, Train, Kenneth E., pp. 37-38.

increases the probability a shipper selects that route. The automotive alpha coefficient is zero while the beta at 6.5 is the highest of any coefficient. This indicates a strong preference for single-line service for assembled auto shipments, even if the route incurs additional mileage.

**Exhibit A-6: Calibrated coefficients for logit model<sup>136</sup>**

| Service type      | Merchandise | Intermodal | Bulk   | Automotive |
|-------------------|-------------|------------|--------|------------|
| Alpha (Impedance) | 2.6355      | 4.4882     | 1.8860 | 0.0000     |
| Beta (Jct. Freq.) | 1.5320      | 0.3088     | 4.2914 | 6.5087     |

The use of impedance and junction frequency to identify the routes most likely to be selected by shippers is consistent with what is seen in the calibration data. Exhibit A-7 categorizes records as either having the market minimum impedance or not, as well as a share equal to the maximum historical share of the market or not.

**Exhibit A-7: Percentage of calibration records by low impedance and maximum share of market criteria (automotive not included since alpha coefficient is zero)<sup>137</sup>**

| Market segment       | Lowest impedance | Non-lowest impedance |
|----------------------|------------------|----------------------|
| <b>Merchandise</b>   |                  |                      |
| Max share of market  | 43%              | 8%                   |
| <Max share of market | 8%               | 40%                  |
| <b>Intermodal</b>    |                  |                      |
| Max share of market  | 20%              | 10%                  |
| <Max share of market | 10%              | 59%                  |
| <b>Bulk</b>          |                  |                      |
| Max share of market  | 65%              | 5%                   |
| <Max share of market | 5%               | 25%                  |

If a “positive match rate” is considered to include routes where either the max-share/low impedance or non-max share/non-low impedance condition holds, Exhibit A-8 shows the match rate table produced for impedance, with all service types scoring over 70% matches. Exhibit A-9 shows a similar analysis comparing historical market share to junction frequency.

<sup>136</sup> See workpaper “HC-Filtered 100% Waybill Data Calibration.xlsx.”

<sup>137</sup> Ibid.

**Exhibit A-8: Percentage of calibration records by service type, where the positive match rate criteria holds for impedance (automotive not included since alpha coefficient is zero)<sup>138</sup>**

| Service type | Meets positive match rate criteria, impedance |
|--------------|-----------------------------------------------|
| Merchandise  | 83%                                           |
| Intermodal   | 79%                                           |
| Bulk         | 90%                                           |

**Exhibit A-9: Percentage of calibration records by low junction frequency (JF) and max share of market criteria<sup>139</sup>**

| Service type          | Lowest JF | Non-lowest JF |
|-----------------------|-----------|---------------|
| <b>Merchandise</b>    |           |               |
| Max share of market   | 49%       | 3%            |
| <Max share of market  | 18%       | 31%           |
| <b>Intermodal</b>     |           |               |
| Max share of market   | 29%       | 2%            |
| <Max share of market  | 39%       | 30%           |
| <b>Bulk</b>           |           |               |
| Max share of market   | 69%       | 1%            |
| <Max share of market  | 10%       | 20%           |
| <b>Automotive</b>     |           |               |
| Max share of market   | 14%       | 1%            |
| < Max share of market | 13%       | 72%           |

Merchandise, bulk, and automotive traffic all exhibit positive match rates above 70%, while intermodal is lower at 59% (Exhibit A-10). The 39% of intermodal routes with the lowest junction frequency and sub-maximal market share reflect that many of the largest intermodal lanes are single-line (e.g., Los Angeles-Chicago and Los Angeles-Dallas). Where interline intermodal rail service has been able to capture share has been in run-through service, such as NS-CPKC on the Meridian Speedway.

<sup>138</sup> Ibid.

<sup>139</sup> Ibid.

**Exhibit A-10: Percentage share of calibration routes by maximum share of market and lowest market junction frequency status<sup>140</sup>**

| Service type | Meets positive match criteria, junction frequency |
|--------------|---------------------------------------------------|
| Merchandise  | 79%                                               |
| Intermodal   | 59%                                               |
| Bulk         | 89%                                               |
| Automotive   | 86%                                               |

### **A.7.3. Execution**

The calibrated coefficients and the 2023 100% waybill data were used to estimate the market share of each route using the pre-merger and post-merger total route impedances and junction frequencies indexed to the market minimums. If no routes in a market were altered based on the changes to Quantanet, no diversions would occur in that market. In markets where UP-NS introduces new competitive service, often the only single line railroad in the market, traffic would be attracted to the UP-NS network, resulting in a diversion. The change in the predicted share of the market a route receives multiplied by the market size (e.g., number of carloads) becomes the amount of diverted traffic. If rail shares increase on one route, the model output will show the rail share decreases on other routes.

The model was first run on pre-merger conditions to establish a base case. There are confounding variables that can differ from market to market for which there is no data to determine their impact. For example, there may be a company with five plants, three of which are served by Railroad A, which has the lowest impedance in those markets, and the other two also served by Railroad A, which does not have the lowest impedance in those markets. The company chooses to use the less efficient rail routes in two markets simply because it only wants to deal with one railroad for all of its plants. To minimize the impact of these and other

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<sup>140</sup> Ibid.

confounding variables, a pre-merger market share is estimated using the logit model. The estimated diversion then becomes the difference between the model estimated pre-merger share and the model estimated post-merger share to isolate the impact of the merger and minimize share shifts based on confounding variables.

For merchandise and bulk traffic, commodity allocations were applied based on the historical percentage of flows of each commodity in every market for revenue calculations. Automotive traffic was assigned to STCC2 code 37 (i.e., transportation equipment), and intermodal traffic was assigned to STCC2 code 46 (i.e., miscellaneous mixed shipments).

Certain flows were excluded from the top-line diverted car totals to focus on traffic that can realistically divert on the combined UP-NS network:

- Intermodal markets between Dallas and all Southeast BEAs, because NS offers interline service with CPKC haulage on the Meridian Speedway, which will not change post-merger.
- Intermodal diversions in origin-destination lanes that do not carry at least 4,380 units per year (i.e., 12 units per day) across existing traffic, rail-to-rail intermodal diversions, truck-to-intermodal diversions, and long-haul drayage diversions, less the impact of offsets.
- Automotive diversions were restricted only to originating SPLCs and terminating BEAs where UP or NS originated or terminated finished vehicles in the 2023 base year data.

## **A.8. Estimated Diversion Impact on Other Railroads**

The net change in carloads handled from rail-to-rail diversions was tallied to estimate the UP-NS merger impact on other railroads. Where a route would lose diverted carloads to the UP-NS network, every reporting railroad on that route was treated as losing the handlings of the diverted car count.

Conversely, where a route would gain diversions, every reporting railroad on that route was treated as gaining the number of handlings. The gain or loss of carloads handled does not sum to the total diversions, because each carload handled applied to each railroad on the route that would lose cars. For example, when traffic shifts from a BNSF-CSXT routing to a UP-NS routing in the model, the diverted carloads are recorded as reductions for both BNSF and CSXT. SCACs were adjusted to be considered part of the same corporate family; thus, a car diverted from a route with KCS and CPRS participation would count as one car lost against CPKC. The net change in carloads handled (i.e., carloads handled gained – carloads handled lost) is reported for each railroad family member.

## **Appendix B. Truck-to-Rail Diversion Model**

### **B.1. Freight Market Sources**

#### **B.1.1. Transearch, S&P Global Markets, 2023**

The truck traffic data for the truck-to-rail analysis came from the Transearch, S&P Global Markets, 2023 freight database, which includes essentially all freight flows within, into, and out of the United States with county-to-county geographic detail and commodities at a four-digit STCC level, for seven modes of transportation.

Transearch is broadly used by private-sector transportation-related firms such as Class I and short-line railroads for market sizing purposes. Public sector users such as state departments of transportation also often use the database as a key input to federally mandated freight and rail plans. The database was developed 40 years ago and has been recognized as long-term market tested and proven, with validation quality control measures in place during each year’s processing cycle. Transearch is constructed and released annually, with validation performed using the Bureau of Transportation Statistics’ Commodity Flow Survey (“CFS”) and the Federal Highway Administration’s Freight Analysis Framework (“FAF”).

Oliver Wyman process the Transearch files provided by S&P Global Markets to add meta-data, aggregate data, estimate truck transit times, and estimate carrier revenues for the non-rail freight traffic. Aggregating data is necessary to remove extraneous detail (e.g. private versus for-hire trucking). The data pipeline is shown in the work paper “Enhanced\_Transearch\_vFinal.sql.” The trucking revenues are estimated on an origin-destination-truck equipment type basis using the methodology in Section B.7 and the transit time methodology in Section B.9. Pricing for

other modes used national average revenue per ton-mile published by the Bureau of Transportation Statistics.<sup>141</sup>

An aggregated version was created for use by CRA to develop the 2023 actual market states and provide the non-rail modes tonnage and revenue at a Business Economic Area (“BEA”) to BEA, STCC4 level-of-detail. The BEAs used are those provided by Transearch for the USA, the regions provided for Canada that largely align to the major CMAs defined by Statistics Canada plus a “rest of province” region, and Mexican states. The aggregation is documented in the work paper “Transearch\_aggregated\_extracts\_for\_CRA.sql” and the two tables produced are named [transearch\_OFIPS] and [transearch\_BEABEA].

### **B.1.2. CRA 100% Waybill Data, 2023**

For the truck-to-rail analysis, traffic flows were provided by CRA, based on 100% waybill data from the six Class I railroads as well as the 2023 CCWS for non-Class I traffic. See Appendix A.2 for the process for producing this data, including steps taken by CRA and Oliver Wyman.

## **B.2. In-Scope Trucking**

Transearch includes four truck-related transportation modes. “Trucks” are defined herein for the analysis includes three truck modes: Truck Truckload and Truck Private (domestic US traffic only), and Truck NEC (NAFTA traffic only). These three truck modes are representative of all the domestic and transborder types of trucking that could be potentially impacted by the merger.

The fourth truck mode, Truck Less-Than-Truckload (LTL), was not included in the analysis, as this type of trucking includes multiple pick-ups and stops along the route and is unlikely to divert.

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<sup>141</sup> This dataset is referenced in the truck-to-rail analysis as “enhanced\_transearch\_full.” See “Average Freight Revenue per Ton-Mile,” Bureau of Transportation Statistics (<https://www.bts.gov/content/average-freight-revenue-ton-mile>). Note that the waterway revenue per ton-mile has been extrapolated to 2023 using the Producer Price Index for Inland Waterways (PCU4832148321), published by the Federal Reserve Bank of St. Louis (<https://fred.stlouisfed.org/series/PCU4832148321>).

However, LTL only makes up 187 million tons (2%) of total Transearch trucking (Exhibit B-1).

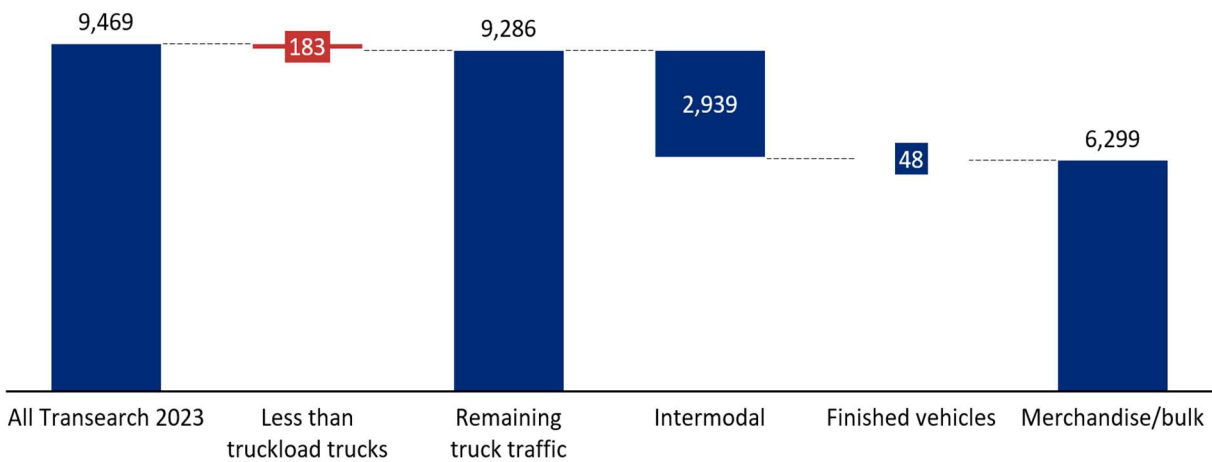
**Exhibit B-1: Transearch truck transportation modes and total tonnage<sup>142</sup>**

| Num. | Description                                          | Total tons (millions) | Included in analysis |
|------|------------------------------------------------------|-----------------------|----------------------|
| 4    | Truck Truckload – domestic US traffic only           | 5,085                 | Included             |
| 5    | Truck Less-Than-Truckload – domestic US traffic only | 187                   | Excluded             |
| 6    | Truck Private – domestic US traffic only             | 4,206                 | Included             |
| 7    | Truck NEC – NAFTA traffic only                       | 212                   | Included             |

After excluding LTL from Transearch truck traffic, the remaining truck traffic was broken into intermodal (34%), finished vehicles (0.5%), and merchandise/bulk (66%) (Exhibit B-2).

**Exhibit B-2: Breakdown of Transearch trucking to intermodal, finished vehicles, and merchandise/bulk<sup>143</sup>**

Millions of tons



These three types of traffic are segmented when calculating diversions due to the different geographic areas this traffic competes in, and because this represents different segments of potential business for the merged UP-NS. Diversions were estimated separately across these three segments, as explained in the next three subsections. Traffic was segmented based on the following rules:

- **Finished vehicles:** Only STCC 3711 commodity, finished vehicles, was considered.

<sup>142</sup>Transearch, op. cit.; see workpaper “C-Appendix B Exhibits vFinal.xlsx.”

<sup>143</sup> Ibid.

- **Intermodal and merchandise/bulk:** Transearch provides no visibility into the likely rail service that truck traffic would convert to; it only provides commodities and the truck equipment type. The best way to infer the likely rail service type (intermodal, carload, automotive, bulk) is the commodity. Based on the Public Use Waybill Sample, the frequency each STCC4 commodity travels in rail intermodal containers vs. carload was calculated. Any commodities with over 50% of their rail traffic in intermodal containers were treated as an intermodal-favored commodity.<sup>144</sup>

### B.3. Intermodal Analysis

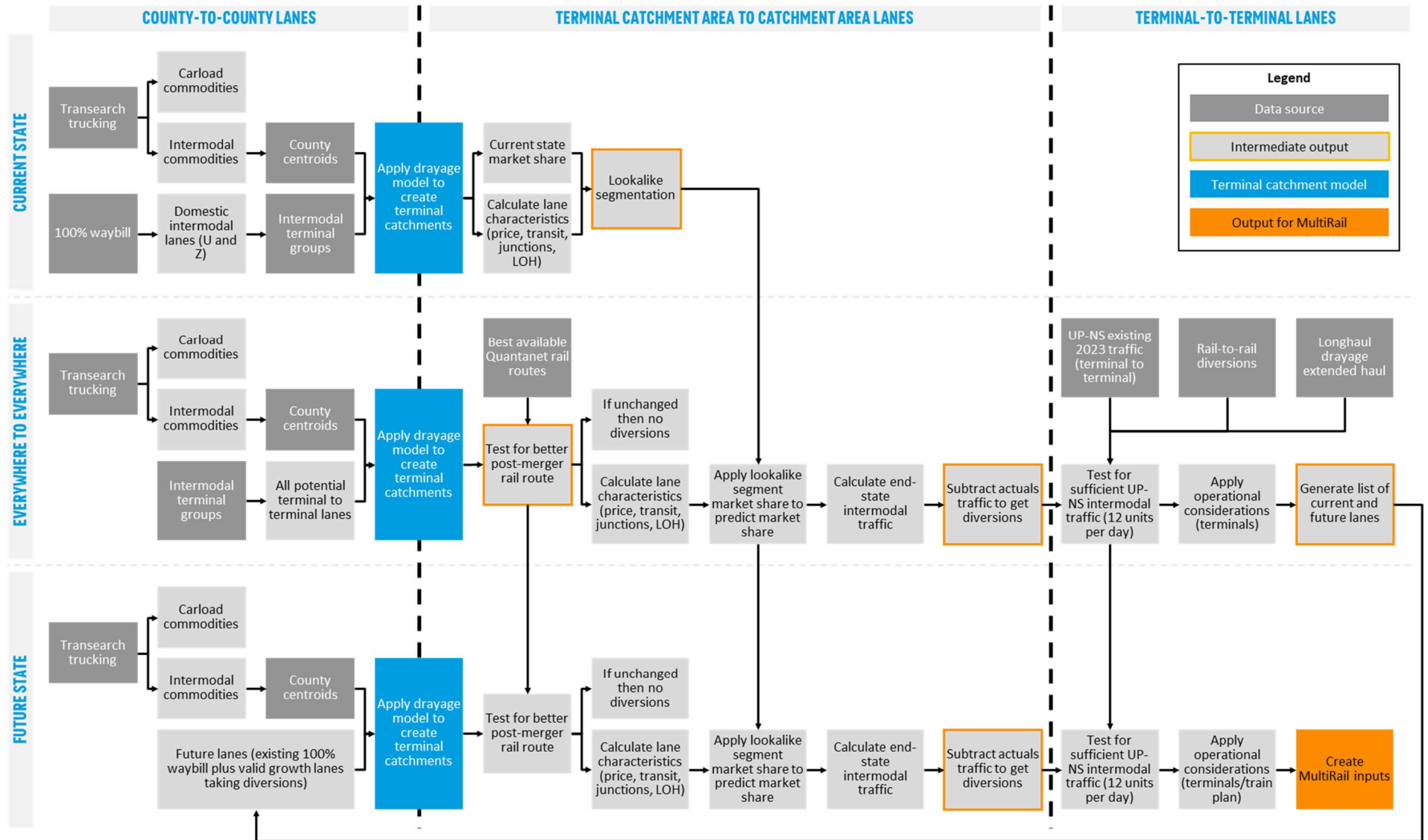
Exhibit B-3 illustrates the architecture of the truck-to-intermodal diversion analysis. This was an iterative three-step process:

1. The **current-state** intermodal share by lane of each lane's serviceable addressable market (truckloads plus intermodal units moving catchment area to catchment area) was calculated, for lanes where linehaul intermodal service is available based on CRA traffic, to calibrate intermodal share by segment, after segmenting lanes by price vs. truck, transit time vs. truck, length-of-haul, and interchange junctions.
2. The **everywhere-to-everywhere** opportunity was sized; that is, linehaul service was allowed between every pair of catchment areas and tested for improvement in rail service as a result of the merger. For those which improved, modal share by segment was applied and then tested for operational considerations to determine if new lanes are feasible.
3. The **future state** is based on linehaul rail service being available in existing lanes (Step 1) plus new lanes (Step 2). Segmentation and operational considerations were then applied, including converting the output to the exact terminal-to-terminal lane for use with MultiRail.<sup>145</sup>

<sup>144</sup> See workpaper "STCC4-CLvsIM.xlsx."

<sup>145</sup> STB Finance Docket No. 36873, Operating Plan Verified Statement, op. cit. MultiRail is Oliver Wyman's proprietary network modeling software, which was used to develop diversion data.

Exhibit B-3: Intermodal truck-to-rail diversion model



### **B.3.1. Total Addressable Market**

The total addressable market for truck diversion to rail intermodal was defined as all trucking with a length of haul over 250 miles and with a commodity defined as intermodal.<sup>146</sup> This amounts to 54 million loaded truckloads<sup>147</sup> out of a total of 608 million truckloads (equivalent to 3,220 million tons).<sup>148</sup>

CRA data does not contain distance data or explicit differentiation between international and domestic intermodal. Distance for waybills in CRA data was calculated between origin and destination stations and a 1.15 coefficient was applied to account for circuitry. To infer international or domestic flag for intermodal services, a two-step process was applied: for records that had a valid AAR equipment code and start with U, the size of the container was inferred from the second numeric of the AAR equipment code (a second numeric of 8 or 9 indicates a 53-foot or larger container, everything else is considered to be international). For all waybills that did not have a valid AAR equipment code (primarily traffic records originating on CSXT and BNSF), domestic or international container type was inferred through deeper analysis of detailed waybill data for the corresponding railway (analyzing car initials of traffic records, calculating domestic/international ratios for specific lanes – and applying these ratios to CRA data).

CRA data shows 10.9 million revenue intermodal units (either loaded or revenue empties), with 5.5 million attributed as domestic and 5.4 million attributed as international (Exhibit B-4). All mode shift is assumed to be from truck to domestic 53-foot intermodal containers.

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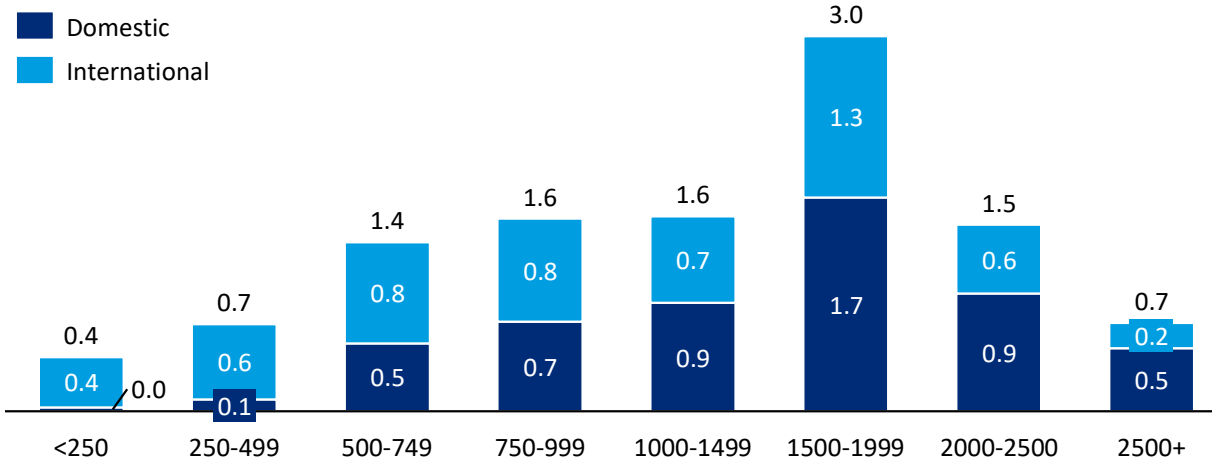
<sup>146</sup> Two hundred and fifty miles was set as a minimum threshold for intermodal to be a feasible alternative to truck, as shorter hauls would be uncompetitive on transit time and price. Categorization of commodities as intermodal, merchandise/bulk, and finished vehicles described in Appendix B.2 In Scope Trucking.

<sup>147</sup> Source: Transearch. Excludes LTL trucking and STCC 42 (empty repositioning). Includes all intermodal-appropriate commodities as defined in Appendix B.2 In Scope Trucking.

<sup>148</sup> Source: Transearch. Includes all truckloads regardless of commodity. Excludes STCC 42 (empty repositioning).

**Exhibit B-4: Rail intermodal units by length of haul <sup>149</sup>**

Millions of units



The total addressable market of truck and intermodal units over 250 miles under consideration is 60 million (54 million loaded truck units plus 5 million loaded domestic intermodal units, as a 53-foot truckload is approximately equivalent to a 53-foot container in capacity).

However, it is important to appreciate that while all domestic intermodal is serviceable by the trucking industry, the reverse is not true (that is, some trucking of containerizable commodities cannot be served by rail intermodal), due to the current terminal footprint and railroad linehaul service offerings. In addition, there are 16.4 million empty truck moves with STCC 42 codes over 250 miles reported by Transearch that could be converted to revenue empty intermodal moves by a railroad.

The potential for improved rail service because of the merger is a key input to sizing the mode shift opportunity. Improved rail service is defined as when the best rail route, terminal

<sup>149</sup> See workpaper “C-Appendix B Exhibits vFinal.xlsx” for query to Transearch source data. Note that while other sources quote higher domestic intermodal revenue unit counts, the CRA analysis of the 100% waybill file identified a significant number of rubber-tire interchanges, which would appear as two independent waybills in other sources. In addition, empty private container moves are treated differently (as these can be revenue moves) by different railroads and industry data sources when calculating the number of intermodal units.

catchment area to terminal catchment area, would see a decrease in impedance (rail miles plus junction impedance) from pre- to post- merger. This will limit the number of trucks available to convert as a result of a UP-NS merger.

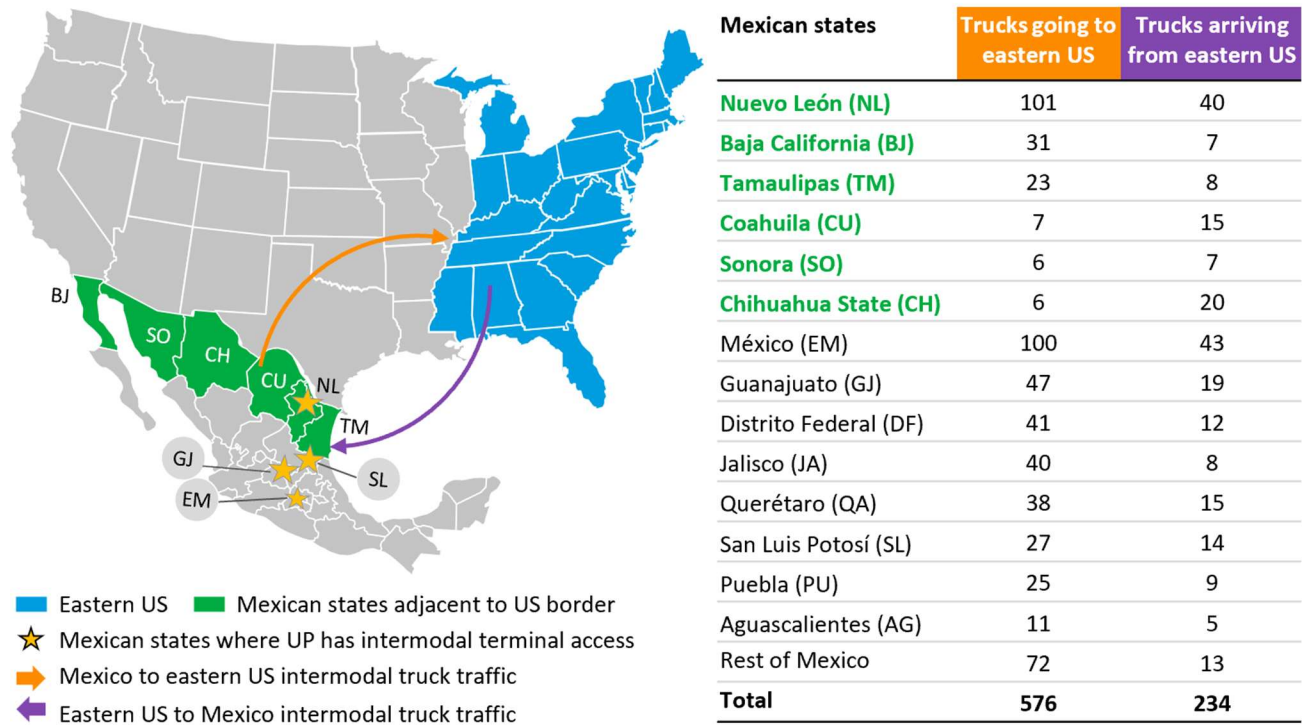
***Mexico and Canada assumptions***

Within the addressable intermodal market, there are 810,000 truck units between Mexico and the eastern United States. These lanes will gain improved intermodal linehaul rail service as a result of the merger. NS does not have interchange access to FXE or KCSM via Eagle Pass, TX, El Paso, TX, or Laredo, TX. The merger would create the opportunity to launch single-line service into the eastern US from these points and serve the transborder trucking market.

However, the transborder market is complex, with moves often involving three trucking carriers and a customs broker. UP does not control access to the terminals in Mexico and would need to rely on a Mexican rail partner to provide access to capacity and commercial control to penetrate this segment.

The addressable market for diversion of trucks to rail intermodal was set at the Mexican states adjacent to the border, with all other long-haul trucking from further into Mexico not addressable. Conceptually, this is based on 1) the lower barrier to converting freight from truck directly to a container (the northern Mexican states are within realistic drayage distance of Port Laredo, TX; Santa Teresa, NM (El Paso, TX); Southern California; and Wilmot (Tucson), AZ intermodal terminals). This reduces the serviceable addressable market to 271,000 truck units to and from the Mexican border states.

**Exhibit B-5: Addressable transborder truckloads traveling between Mexico and eastern US<sup>150</sup>**  
Thousands of truckloads



Canadian transborder trucking is addressable for diversion where trucking can access a US terminal (e.g., Windsor, ON trucks diverting to a Detroit-Toledo intermodal terminal).

Diversions from Canadian regions requiring a Canadian intermodal terminal for access (e.g., Montreal, QC) are not considered because the merger would not enable the creation of any new single-line lanes or clear service improvements. Both UP and NS already have interchange access to both Canadian Class I railroads, so nothing will change post-merger.

### ***Other assumptions***

The analysis assumed no geographic substitution or changes to the location of logistics facilities as a result of the merger. Large and sophisticated shippers consider the holistic cost of

<sup>150</sup> Note: Truck units defined as transborder trucks carrying intermodal commodities traveling between Mexico and eastern US. UP has intermodal terminal access in the Mexican states of Nuevo León, México, and Guanajuato via FXE, and in México, San Luis Potosí, and Nuevo León via CPKC. See workpaper “C-Appendix B Exhibits vFinal.xlsx.”

their supply chain from supplier to buyer. Over the time horizon of this analysis, shippers would not be able to reshape the geography of their supply chains to utilize any rail service improvements created by the merger (e.g., relocating national distribution centers to new metro areas). There was no attempt to include the effects of onshoring, changing import/export ports-of-entry, or other macro supply chain strategies that might change post-merger.

### **B.3.2. Run-Through Haulage Adjustments for Junction Impedance**

Run-through intermodal trains with haulage agreements operate closer to a crew change than a regular interchange, which is reflected with lower impedance than the standard 350 miles-equivalent for an interchange with >50 loaded units per day. This was set at a 90-mile equivalent, which represents three hours at an average train speed of 30 miles per hour, as a realistic representation of the additional complexity from the handoff. In the future state, one interchange was removed from the Meridian Speedway for the traffic via Shreveport, because it changes from three carriers (UP, NS, CPKC) to two carriers (UP-NS, CPKC) and is a short bridge move. This was validated with both railroads' operations departments.

The following adjustments were made to route impedances to better reflect the penalties of run-through haulage agreements being lower than true interchanges:

- Intermodal
  - The UP-CPKC-NS interchange lanes via Shreveport, LA onto the Meridian Speedway received 180 impedance in the pre-merger case (interchange at Shreveport, LA and Meridian, MS), and 90 impedance post-merger (simplified to a UP-CPKC haulage agreement).
  - The BNSF-CSXT interchange at Birmingham received 90 impedance in both the pre- and post-cases for the BNSF lanes to/from Atlanta Fairburn and the Southeast.

- All BNSF-CSXT traffic between BNSF's Los Angeles terminals and CSX's NW Ohio terminal in North Baltimore, OH received 90 impedance.
- The NS-KCS interchange at Meridian received 90 impedance for lanes to/from the Wylie terminal in Dallas, TX.
- All service types: All routes that include NS and Ayer, MA received 90 impedance.

### **B.3.3. Serviceable Addressable Market**

The serviceable addressable market (SAM) was defined to reflect the door-to-door economics of trucking versus rail intermodal, which must reflect realistic terminal catchment areas, availability of linehaul rail service, and drayage costs.

#### ***A. Terminal catchment areas***

Transearch trucking data is on a county-to-county basis, which must be aligned with door-to-door intermodal service, which is a three-stage process: origin drayage (shipper to origin intermodal terminal), linehaul rail service (from origin intermodal terminal to destination intermodal terminal), and terminal drayage (from destination intermodal terminal to the receiver).

Defining the serviceable market for an intermodal lane required establishing a catchment area for the terminal to determine which counties are served. The catchment area will vary based on the length of haul to fairly reflect drayage economics, where a longer drayage move at the origin or destination could still be competitive to a long-haul truck move.

The catchment areas also will be asymmetric. An eastbound trip at a given length of haul will be less competitive for an origin county to the east of the intermodal terminal than to the west, because the intermodal move will be circuitous and add cost and transit time.

To create realistic and dynamic lane catchment areas, the model considered available terminals, linehaul rail service, and business rules on circuitry for all county-to-county pairs. Each county was converted to a “freight centroid” (i.e., a point center of mass for freight) based on the density of railroad FSACs, as an approximation for freight activity, or the population centroid if that was not available. This is fully detailed in Appendix B.3.3.B.

Intermodal terminals also were grouped into intermodal markets that are largely aligned with BEAs. The adjustments to the BEA assignment of CCWS traffic data is shown in Appendix D. Larger BEAs were partitioned to better reflect the different intermodal markets and align with the UP-NS terminal network (e.g., Laredo, TX was separated from San Antonio, TX, which are grouped together in the CCWS), to ensure diversion growth traffic was assigned to the correct terminal(s) on the UP-NS network.

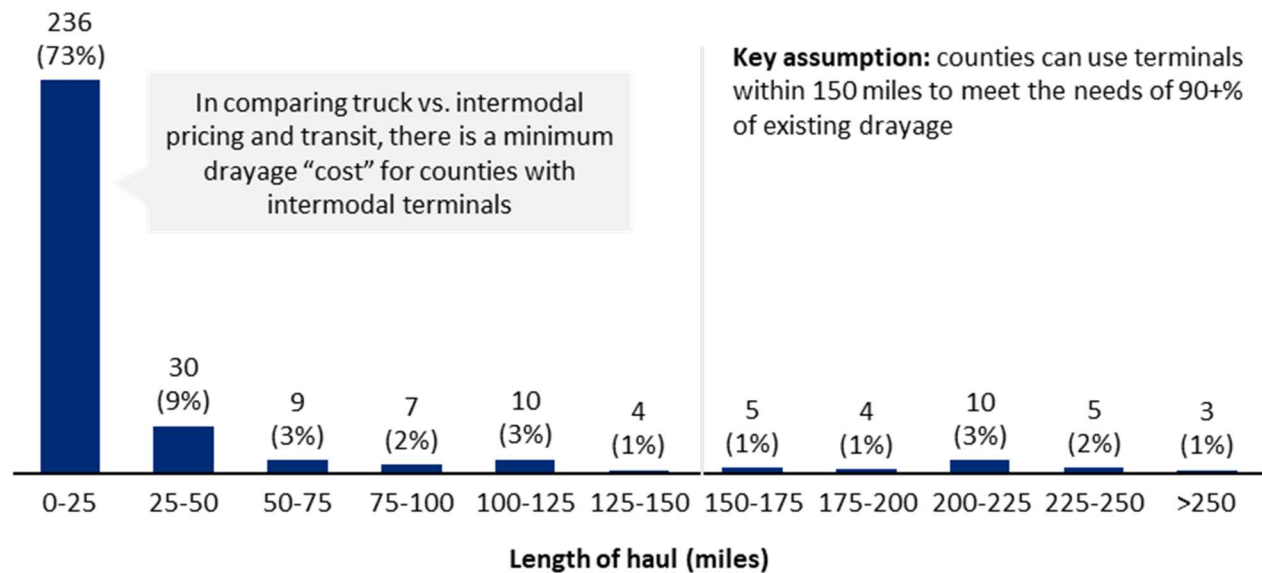
The county (FIPS code) with the most intermodal originations plus terminations in the CCWS was considered the primary terminal county for each intermodal terminal group for the purposes of measuring drayage distances.

For a county-to-county truck lane to be considered part of the serviceable market for an intermodal terminal-to-terminal lane, the following criteria had to be met:

- Maximum drayage distance: Both origin and destination county centroid must be within 150 miles of the centroid for at least one primary terminal location county for an intermodal terminal market. Based on Transearch data, over 90% of all drayage is under 150 miles, as shown in Exhibit B-6. The 150-mile maximum was set based on this data analysis as a realistic basis for mode share calculations.

**Exhibit B-6: 2023 origin plus destination rail intermodal drayage by length of haul<sup>151</sup>**

Millions of tons, total = 321 million



- Available linehaul rail service: There must be rail service between the origin and destination intermodal markets.
- Drayage economics: Total drayage mileage must be less than 20% of total intermodal mileage (origin drayage plus linehaul rail plus destination drayage mileage). In my judgement, this is a reasonable modeling assumption and was confirmed with the railroad intermodal marketing departments. Drayage is an important part of the intermodal service offering, as it drives a disproportionate amount of the cost to the shipper compared with door-to-door mileage.
- Circuity: Door-to-door circuity versus truck must be below 1.57, defined as intermodal mileage divided by truck mileage. This is based on average rail to truck circuity plus 25 percentage points, since the purpose of these criteria is to set an upper bound on what is the valid serviceable market for an intermodal lane.

<sup>151</sup> Transearch, op. cit.; see workbook “C-Appendix B Exhibits vFinal.xlsx.”

To match county-to-county lanes to intermodal terminal-to-terminal lanes, the model takes a simple approach to picking the best intermodal lane when multiple valid options are available: The best intermodal lane will have the lowest door-to-door cost. It scores each valid lane based on drayage and intermodal mileage using a 6.6:1 ratio.<sup>152</sup> This captures the difference in average price per mile for shorthaul trucking, based on DAT data, of \$5.48, which is representative of a drayage price, and the average revenue per mile for an intermodal unit for the linehaul move, as determined through analysis of the 100% waybill dataset. While simplified, the logic will capture the trade-off shippers make between trucking versus drayage to the nearest intermodal terminal – even if this adds circuitry or total door-to-door mileage.

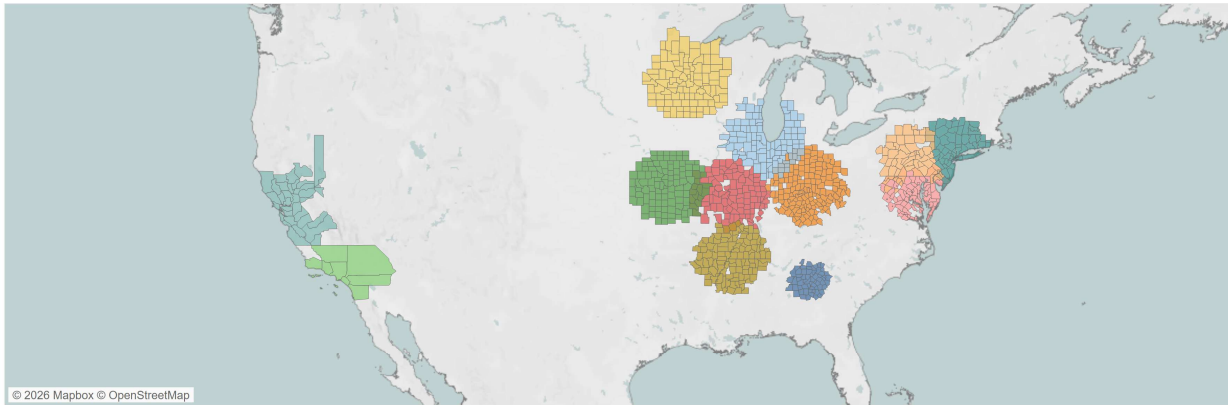
As an illustration of the outcome of this model, consider the example of Jacksonville, FL (Exhibit B-7). The model looked at all county-to-county truck lanes into the Jacksonville, FL catchment area. It applied drayage economics to create appropriate terminal catchments. Note that the Atlanta, GA lane catchment is smaller – at both ends – compared to longer haul lanes. Where other nearby terminals offer alternative service, the catchment areas will differ by lane. Most lanes to Jacksonville, FL have a larger destination catchment than the Los Angeles lane. This is because the model also has identified Los Angeles, CA to Charleston, SC as a truck-to-rail diversion lane. This means trucking to counties further north will begin to prefer using Charleston, SC over Jacksonville, FL because of the reduced drayage mileage.

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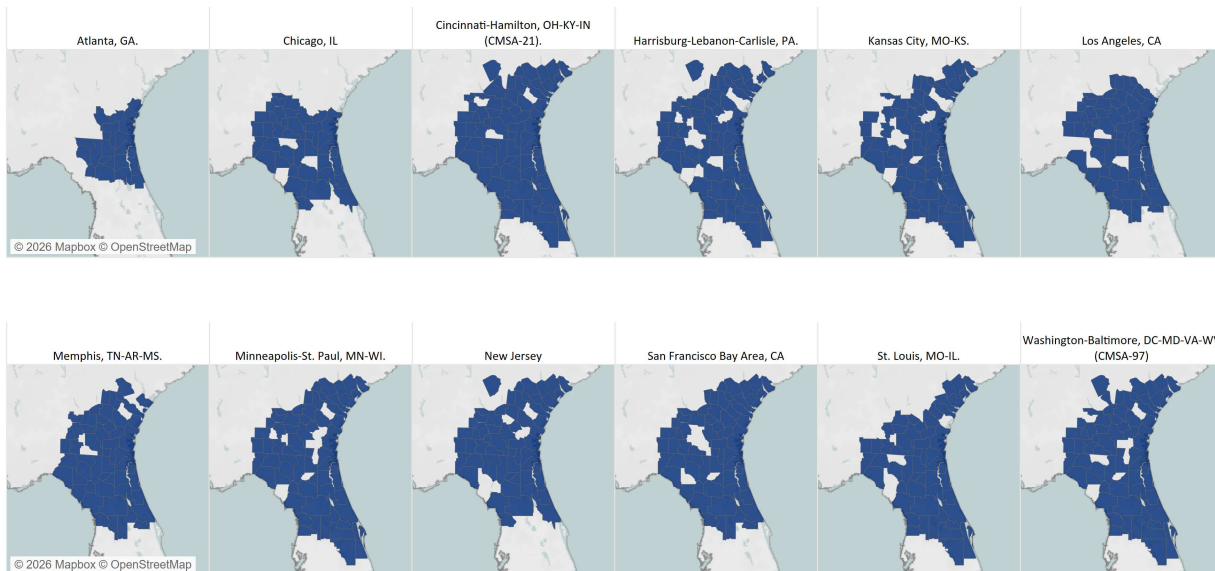
<sup>152</sup> The 6.6:1 ratio is the DAT shorthaul truck price divided by the average intermodal unit revenue per mile.

**Exhibit B-7: Drayage catchment areas: example of domestic intermodal lanes to/from Jacksonville, FL for sizing truck-to-rail diversions; counties shaded where served<sup>153</sup>**

Other terminal catchments



Jacksonville catchments by lane



The model was applied at each stage of the iterative analysis: 1) existing terminal-to-terminal rail service, 2) everywhere to everywhere rail service (i.e., every possible terminal pair offered, regardless of railroad), and 3) post-merger terminal-to-terminal rail service, where all lanes exceed the minimum volume threshold and other operational criteria.

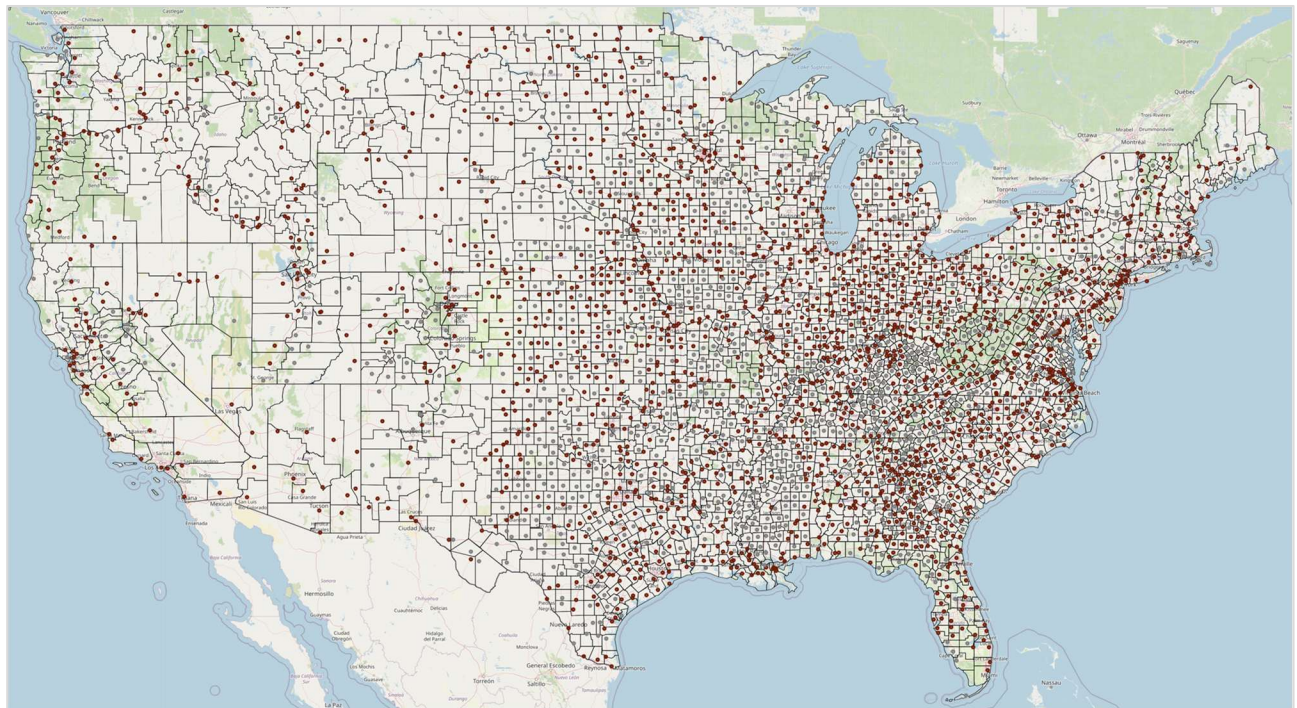
<sup>153</sup> Counties with no freight are not shown for each catchment area. See workpaper “intermodal\_catchment\_visualizations.twb.”

### ***B. County centroid methodology***

A centroid for each county was estimated using a weight-based method, where CCWS station data was available, and a population-based method otherwise. For the freight-based approach, a weight for each freight station equal to its total tons originated or terminated in the CCWS was calculated, each station was assigned a latitude and longitude from the Unified Station Master, and the county’s freight centroid was computed (as the weighted average of the coordinates of all CCWS-represented stations located within that county). For counties with no stations represented in the 2023 CCWS, the US Census Bureau’s 2020 Census Population centroid dataset was used to approximate the county’s center of economic activity.

#### **Exhibit B-8: County centroids for the lower 48 states<sup>154</sup>**

Freight weighted in brown and population weighted in gray



<sup>154</sup> See workpaper “Center\_of\_Freight\_Mapping.ipynb.”

***C. Existing terminal-to-terminal rail service***

There is terminal-to-terminal domestic intermodal rail service in 138 directional origin-destination catchment areas.<sup>155</sup> Current service was based on the data received from CRA, which contained the ultimate origin and ultimate destination Freight Station Accounting Code (“FSAC”), Standard Carrier Alpha Code (“SCAC”), and SPLC for both origin and destination), commodity (STCC) (both with and without designation), full rail route of the shipment, equipment type (AAR equipment codes with either the full four symbol codes or just the first symbol, where full code was unavailable). Identification of data regarding intermodal traffic was done on the basis of AAR equipment codes starting with “P,” “Q,” “S,” “U,” or “Z.”

CRA-provided data was further enhanced by adding an identifier of whether a flow was carried in a 53-foot container or international container. For traffic flows where the AAR equipment code was provided in full (all four symbols), the size of the container was established according to the second numeric of the code.<sup>156</sup> For traffic flows where the AAR equipment code was limited to the first symbol, assignment of domestic/maritime was determined by calculating of the ratio of domestic to international containers on a particular route, using full waybill data provided by the corresponding Class I railroads (where type of container was estimated via equipment initials or shipper or consignee names).

***D. Serviceable truck market and intermodal modal share***

Based on the model’s analysis of the current network of domestic intermodal lanes and terminal catchments as described above, nine million units (meaning truckloads + loaded

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<sup>155</sup> See workpaper “HC-Intermodal Diversions Model vFinal.xlsx.”

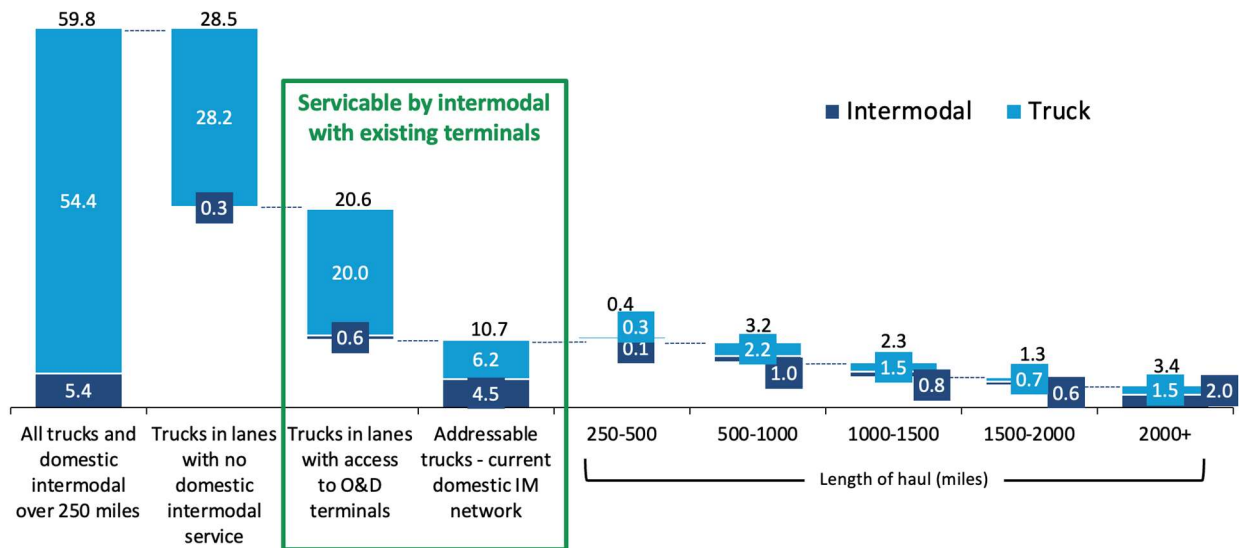
<sup>156</sup> Neubauer, Eric A. "Guide to Car Type Codes," 2007; see reference source “AAR\_CarType\_Codes.pdf.”

intermodal containers) are in lanes that also are currently served by domestic intermodal (Exhibit B-9).

A further 20.6 million truckloads of intermodal-addressable freight is in lanes that could theoretically be served by intermodal using the existing intermodal terminal network under the “everywhere to everywhere rail service” scenario. This does not consider the feasibility of offering linehaul rail service that would enable a truck-competitive intermodal rail service product, as this would require opening many subscale interline lanes, which may be highly circuitous. It is included to show how the serviceable market could expand through the addition of new routes, which is projected to be a key source of growth traffic from the UP-NS merger.

**Exhibit B-9: Serviceable addressable market for truck-to-rail intermodal diversion<sup>157</sup>**

Millions of truck/intermodal units



Existing intermodal traffic in lanes without access to O&D terminals and/or no domestic intermodal service are domestic intermodal waybills which use terminals that are either classified

<sup>157</sup> See workpaper “HC-Intermodal Diversions Model vFinal.xlsx.”

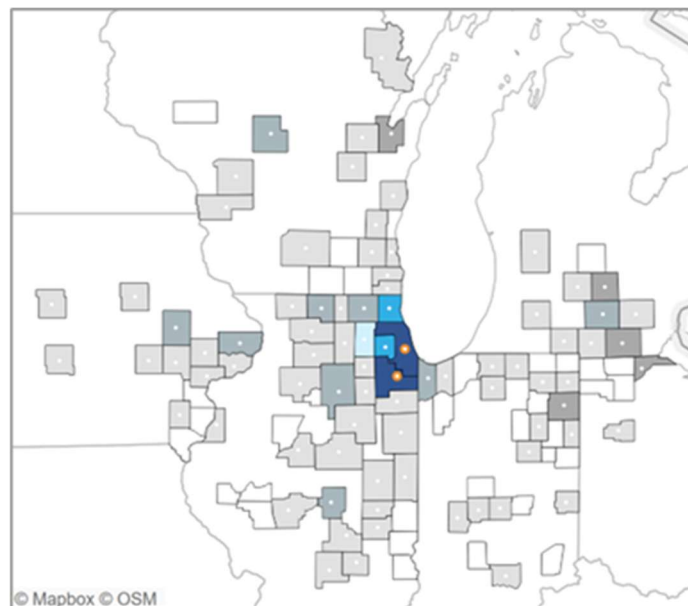
as international only (potentially inaccurate waybill data or mis-classification) or in lanes with less than 12 units per day. This will include the large quantity of rubber-tire interchanges in Chicago that utilize two scaled intermodal lanes even if the true origin to true destination lacks the density. The CRA waybill dataset includes stitching together waybills which are rubber-tire interchange even where the full routing may not be visible to either railroad (i.e., waybills which look like two separate local moves, one terminating at Chicago and one originating at Chicago).

***E. Extended haul to substitute for long-haul drayage***

In addition, the addressable opportunity to convert truck to rail intermodal includes extended haul of existing intermodal, where a long-haul dray >150 miles is required. There are two geographic markets where this is relevant: drayage from Chicago, IL to Detroit, MI and northern Ohio (Exhibits B-10 and B-11); and drayage from Memphis, TN to Huntsville, AL and northern Alabama (Exhibit B-12). Total addressable intermodal units, based on drayage moves, is sized at 175,000.

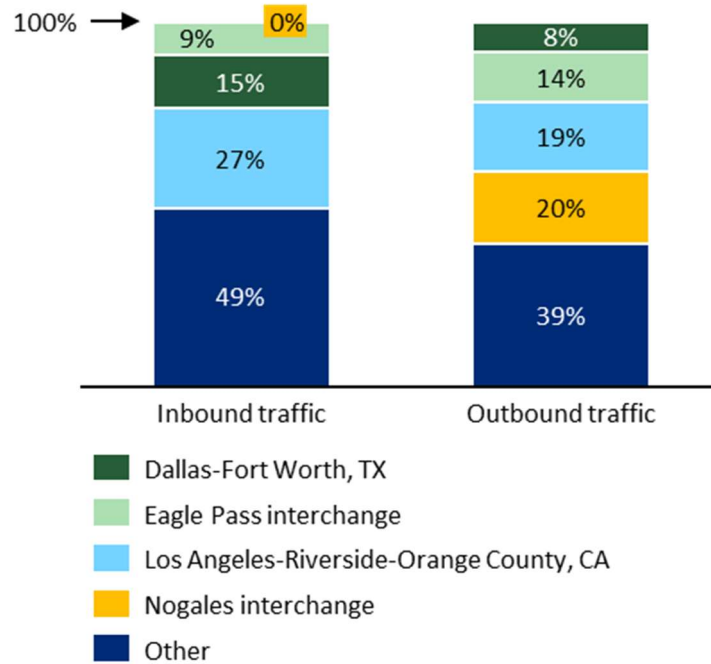
**Exhibit B-10: Heatmap of drayage from Chicago by destination county<sup>158</sup>**

Darker colored indicates more drayage activity, orange dots indicate Chicago area intermodal terminals

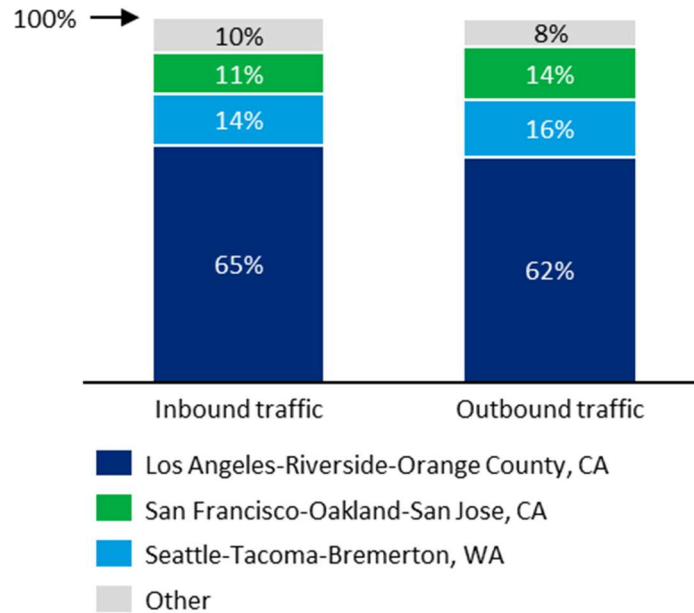


<sup>158</sup> Transearch op. cit., mapped using Tableau.

**Exhibit B-11: UP mix of intermodal traffic to long-haul drayage O/D BEAs from Chicago, IL<sup>159</sup>**  
Percentage of intermodal traffic



**Exhibit B-12: UP mix of intermodal traffic to long-haul drayage O/D BEAs from Memphis, TN<sup>160</sup>**  
Percentage of intermodal traffic



The intermodal drayage traffic reported by Transearch (STCC codes 5021 and 5022) in these lanes was approximately matched up with the linehaul rail move to and from the western

US using data provided by UP’s marketing department. This data was derived from UP’s internal container waybill data, which includes information on the true origin and destination of shipments at the ZIP code level. This was treated as a representative sample and used to convert 70,000 long-haul drayage moves into the true origin to true destination, which could ultimately divert into an extended haul rail move (e.g., moving by rail from California to Detroit, MI instead of California to Chicago, IL).

### **B.3.4. Model Methodology**

#### ***A. Mode shift sizing methodology***

A lookalike methodology was employed at the lane level to size the intermodal traffic modal shift that could result from the merger. This relied on the following overarching assumptions:

- Given similar trade-offs between truck and rail freight products (transit time differentials, price differentials, service differential), shippers will make their mode choice consistently across the United States.
- New UP-NS terminal-to-terminal single-line service options would result in new truck-competitive intermodal linehaul products with characteristics comparable to existing single-line service lanes offered by Class I railroads.
- There would be a meaningful improvement in the existing interline intermodal lanes offered today and these lanes would behave like existing single-line service lanes offered by Class I railroads.
- Decisions are made at the margin on a lane-by-lane basis, meaning shippers do not make all-or-nothing buying decisions between truck and rail.

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<sup>159</sup> See workpaper “HC-Long-Haul Dray vFinal.xlsx.”

<sup>160</sup> Ibid.

- All domestic intermodal traffic, existing plus the mode shift growth opportunity, is treated as a “gray box,” meaning that the analysis did not consider any differences that could occur as a result of the available domestic intermodal channel partner.

After the lookalike analysis estimated mode shift potential, operational considerations were applied. For the merged railroad to offer linehaul rail service, minimum density and feasible train service must be available, in addition to a UP or NS terminal being available at the origin and destination.

With this criteria, the list of existing and feasible lanes was then used to size the serviceable market a second time and apply the lookalike analysis to get to the final diverted truck traffic volume that could potentially shift to rail intermodal as a result of the merger.

#### ***B. Segmentation and lane lookalike analysis***

The lookalike approach compares each lane that would receive improved rail service post-merger with an appropriate group of current-state lanes with similar characteristics. Over time, shippers would evaluate their mode choices in the same way as they do for similar current-state lanes today and the end-state rail market share would increase to that level for improved lanes.

Intermodal lanes were grouped based on the following characteristics: length-of-haul, interline or single-line rail linehaul, transit time versus truck, and price versus truck. The first two characteristics are rail-centric and capture how intermodal typically takes higher share in longer haul lanes and to show the difference between interline and single-line lanes in the current state. The second two capture key decision factors for shippers: price and transit. Based on Oliver Wyman’s collective experience, when intermodal can offer transit times of truck plus one day and offer a 10% lower price than truck, a shipper is likely to strongly consider intermodal as a competitive substitute for truck.

Each of these factors was analyzed for each intermodal lane using the following methodology:

- **Length of haul** is based on average intermodal mileage. Intermodal mileage is the sum of linehaul rail mileage (terminal-to-terminal) and average drayage mileage (origin and destination).
  - Rail miles are the terminal-to-terminal rail miles for the lowest impedance route, as calculated using Oliver Wyman’s Quantanet model, for that intermodal market to intermodal market lane.
  - Average drayage mileage is the weighted average distance from the terminal county to the centroids of all counties in the catchment area, for origin plus destination. Length-of-haul is segmented in 500 mile increments up to 2,500 miles.
- **Interline or single-line rail linehaul** comes directly from Oliver Wyman’s Quantanet model. For the best rail route, the number of Rule 260 Junctions was calculated.
  - The Quantanet model applies an impedance factor to junctions, so that the “best route” reflects the benefits of single-line service. For this analysis, junction impedance was increased at gateways which do not have any steel-wheel interline intermodal service today (e.g., New Orleans, LA).
  - This generated a set of feasible routes for each lane that represent where intermodal linehaul rail service is available today or could be readily offered.
- **Transit time** differences between modes were calculated for trucks and intermodal differently to reflect mode differences:
  - For truck, Federal Motor Carrier Safety Administration hours-of-service rules were applied to the average truck mileage in the lane and a 50 mph truck velocity (see

Appendix B.9). Average truck mileage was weighted and averaged across all Transearch county-to-county traffic records in the intermodal lane.

- The intermodal door-to-door transit time is the sum of five trip stages: origin drayage, origin terminal dwell, rail linehaul, destination terminal dwell, and destination drayage.

The assumptions used are shown in Exhibit B-13.

**Exhibit B-13: Assumptions for intermodal door-to-door transit time**

| Assumption                   | Description                                                                                               |
|------------------------------|-----------------------------------------------------------------------------------------------------------|
| Intermodal train velocity    | 30.7 miles (STB EP 724, <sup>161</sup> unweighted average) to convert linehaul rail miles to transit time |
| Interchange dwell            | 22 hours (STB EP 724, unweighted terminal dwell)                                                          |
| Average origin dwell         | 6 hours (Oliver Wyman experience plus validation with railroads)                                          |
| Average destination dwell    | 12 hours (Oliver Wyman experience plus validation with railroads)                                         |
| Minimum drayage transit time | 2 hours                                                                                                   |
| Drayage truck velocity       | 50 mph                                                                                                    |

What is most important is the difference in transit time between truck and intermodal, not the absolute transit time. The intermodal lanes were segmented into three categories: truck plus 24 hours, plus 72 hours, and worse than plus 72 hours.

- **Price differences** between modes were taken from the DAT 2023 lane-level data for trucks and matched to the intermodal lane.
  - The intermodal door-to-door price was estimated using the drayage cost, based on mileage from the FIPS centroid with the intermodal terminal to the door FIPS, and intermodal linehaul revenue (i.e., purchased transportation) plus a gross margin.
  - Drayage cost is based on shorthaul truck pricing in the DAT as representative of a drayage carrier operation and pricing. In addition, a minimum threshold was set of \$200,

<sup>161</sup> US Code of Federal Regulations, Title 49, Part 1250, op. cit.

based on Oliver Wyman’s experience in this sector, as even a 1-mile drayage move will typically take 1-2 hours of driver and tractor time.

- Intermodal line haul revenue was estimated by calculating an average directional revenue per unit-mile for IANA region to region lanes<sup>162</sup> using the CRA data. Calculating this on a directional basis provides a good approximation of linehaul rates for new lanes. For one specific flow (Gulf to/from South Atlantic) which has only one large lane (Dallas, TX – Atlanta, GA), internal railroad pricing benchmarks were used to establish a linehaul rate.
- Purchased transportation (two drayage moves, one linehaul move) is not the full door-to-door price paid by a shipper. Pricing to the shipper will include the intermodal marketing company (IMC)’s equipment, SG&A, and empty repositioning costs plus a profit margin. An outside-in analysis<sup>163</sup> of J.B. Hunt’s 2023 financial reports for its intermodal segment estimated gross margin at 36%, meaning the price to shipper is *purchased transportation* \*  $(1 + 36\%)$ . This was applied to all lanes with no headhaul-backhaul adjustment.
- This pricing analysis was used to segment intermodal lanes based on the typical discount to truck on a door-to-door basis into 10+ % premium to truck, within 10% of truck, and a 10+ % discount to truck. See Section 8 for a description of projected railroad revenues from diversion traffic.

For all segmentation categories, the relevant intermodal lanes were used to calculate the weighted average intermodal mode share (*[total intermodal units] divided by [total truck plus intermodal units]*). A minimum of three intermodal lanes was required for the segment to be calculated and considered a valid reference mode share (Exhibit B-14).

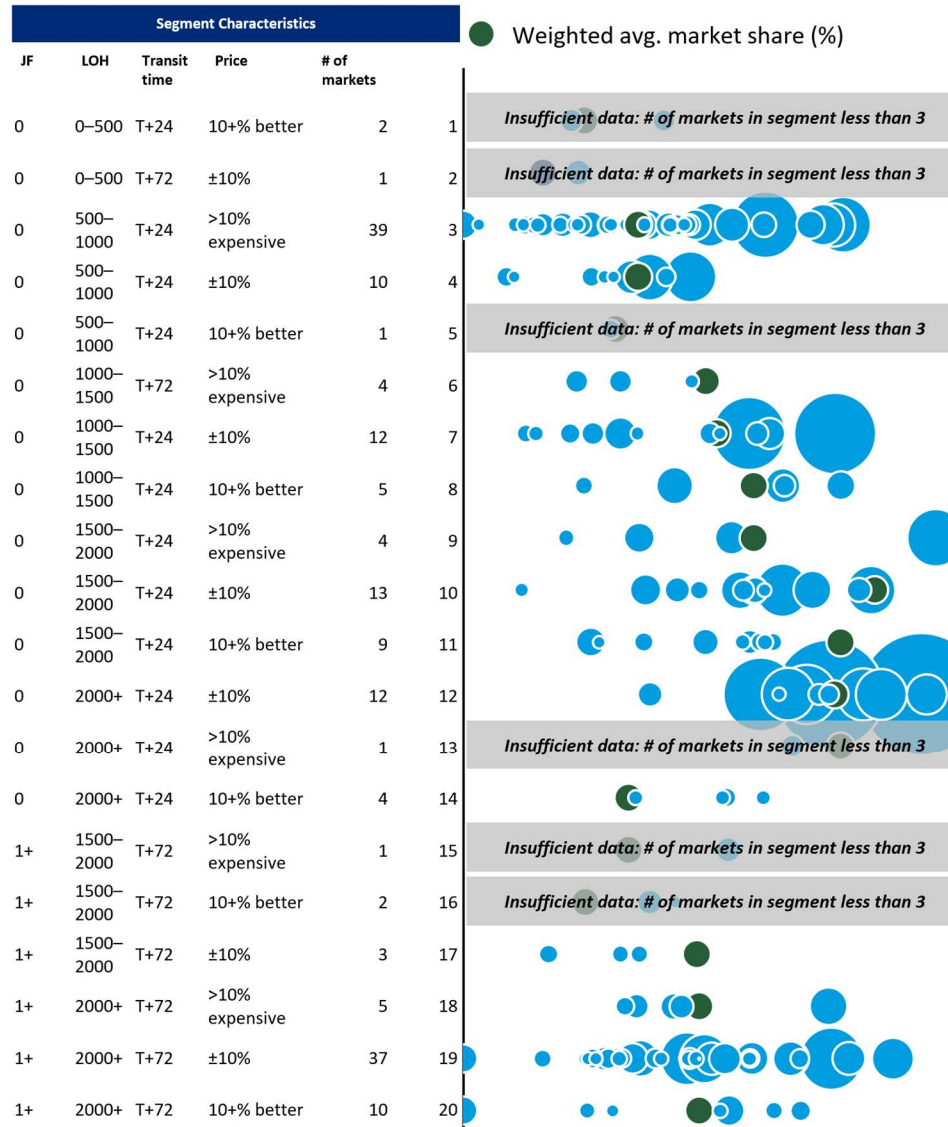
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<sup>162</sup> IANA region definitions by state: <https://intermodal.org/iana-dashboard>.

<sup>163</sup> See workpaper “JBHT Operating Metrics vFinal.xlsx.”

**Exhibit B-14: Weighted average intermodal rail market share for 20 segments<sup>164</sup>**

Markets in segment = # of bubbles, size of bubble = # of intermodal units in market



For segments with insufficient existing lanes, a filling process was used. The assumption was that intermodal mode share should perform at least as well at a shorter length of haul. If looking at the shorter length of haul categories does not produce a valid result, the matching criteria looked at the same length of haul and gradually relaxed the matching criteria. First, it

<sup>164</sup> See workpaper “HC-T2R Intermodal Segmentation Dataset vFinal.xlsx.”

considered lanes with a different price difference category, then transit time, and then finally relaxed the requirement to match on junctions. This ensured that all relevant combinations produced a realistic intermodal share.

The intermodal lanes which could receive improved rail service post-merger were segmented based on their post-merger characteristics. The weighted average mode share was then applied to the serviceable addressable market (truck plus any existing intermodal traffic) to determine potential post-merger traffic once a lane reaches maturity.

***C. Extended haul to substitute for long-haul drayage***

The methodology applied here to size the mode shift opportunity was based on the following assumptions:

- Addressable long-haul drayage splits 50:50 between UP and BNSF, because both offer the full range of lanes from West Coast and Texas markets to/from the Chicago, IL and Memphis, TN markets.
- Post-merger, UP would market extended haul at legacy NS network terminals at Detroit, MI; Toledo, OH; and Huntsville, AL to the existing customer base as an alternative to bypass Chicago.

Shippers would choose this option for 100% of their existing intermodal freight moving on UP in these true origin to true destination lanes, because the linehaul rail service would improve versus a short-haul move after a steel-wheel interchange, which is the current alternative. The longer rail move would save shippers money and time versus their current intermodal move to the gateway and expensive long-haul drayage. If intermodal was already meeting the needs of this freight to the gateway city, then a longer haul across the watershed would also meet these needs.

The result of applying these assumptions adds 70,000 units of extended haul diversions. This would add 26,256,000 unit-miles to the network of incremental traffic. The traffic, in units, is unchanged, as these units already involve a long-haul move on UP.

## **B.4. Finished Vehicles Analysis**

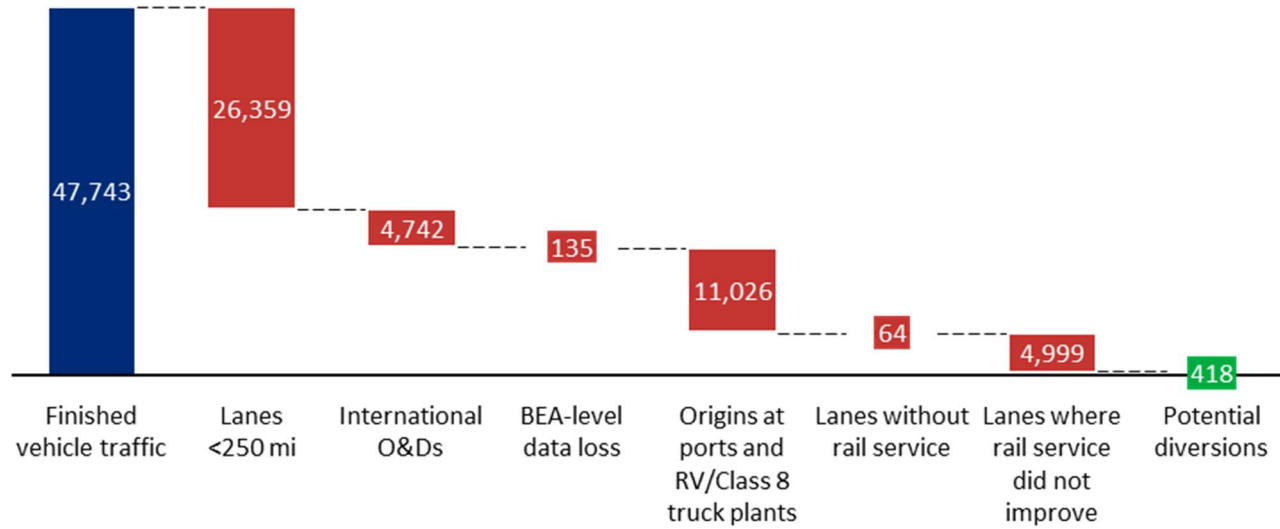
### **B.4.1. Addressable Market**

Finished vehicle traffic is defined as automotive shipments (STCC = 3711) from Transearch (47.7 million tons) (Exhibit B-15). To determine feasible diversion cases from this initial pool of truck traffic, a series of exclusions was applied to identify lanes where rail could capture market share. From these exclusions, an estimated 418,000 tons, less than 1%, have the potential to be diverted by the UP-NS merger. The following exclusions were developed in close collaboration with UP and NS subject matter experts:

- Lanes less than 250 miles are not likely to be addressable by rail;
- International origins and destinations: finished vehicles crossing the border are typically already shipped via rail or NS and UP do not have access to the plant;
- Lanes that were unable to be accurately identified, due to data limitations;
- Traffic originating in counties with Class 6-8 truck, school bus, and RV OEM assembly plants, as these vehicles are not suitable for transport by rail;
- Ports, since finished vehicles arriving at a port are not generally trucked long-haul across the watershed region, and rail has fully penetrated this segment;
- Lanes without rail service where a UP-NS merger would not improve service; and
- Lanes where rail service would not improve post-merger.

**Exhibit B-15: Breakdown of addressable finished vehicle truck traffic<sup>165</sup>**

Thousands of tons



The top 10 origins excluded as ports or as Class 8/RV OEMs, accounting for 11 million tons of finished vehicle traffic, are shown in Exhibit B-16.

**Exhibit B-16: Top 10 truck origins excluded as a port or Class 8/RV OEM<sup>166</sup>**

| County               | Originating truck tons (shipments >250 miles) | Port or OEM    |
|----------------------|-----------------------------------------------|----------------|
| Glynn County, GA     | 1,141,953                                     | Port           |
| Baltimore City, MD   | 829,690                                       | Port           |
| Pulaski County, VA   | 808,795                                       | Class 8/RV OEM |
| Denton County, TX    | 668,305                                       | Class 8/RV OEM |
| Ross County, OH      | 662,233                                       | Class 8/RV OEM |
| Duval County, FL     | 580,064                                       | Port           |
| Pierce County, WA    | 355,517                                       | Port           |
| Ventura County, CA   | 340,832                                       | Port           |
| Rowan County, NC     | 311,316                                       | Class 8/RV OEM |
| Multnomah County, OR | 277,999                                       | Port           |

<sup>165</sup> Transearch op. cit., see workpaper “C-Appendix B Exhibits vFinal.xlsx.”

<sup>166</sup> See workpaper “C-Appendix B Exhibits vFinal.xlsx.”

## B.4.2. Process to Estimate Diversions

Which finished vehicle lanes for trucking would most likely divert to a combined UP-NS network was then analyzed. Lane were constructed with county origin and destination BEAs, providing visibility into how domestic automotive traffic flows from individual plants to markets across the US. Given the unique infrastructure considerations and limited pool of shippers for finished vehicle traffic, a manual approach was used to select truck-to-rail finished vehicle diversions. Specifically, the following criteria were evaluated to determine which finished vehicle lanes could be potentially diverted. These criteria were developed in close collaboration with NS and UP experts (see also Exhibit B-17):

- Excluded economic area destinations without an auto ramp;
- Excluded OEM origins to which neither NS nor UP has access/contract. OEMs with existing long-term contracts with other shippers also were excluded under this condition, even if NS or UP technically has access to the customer facility; and
- Excluded OEM origins that have lower volumes but higher sensitivity to transit time. Per experts at NS and UP, plants like Mercedes in Alabama and BMW in South Carolina were excluded under this criterion.

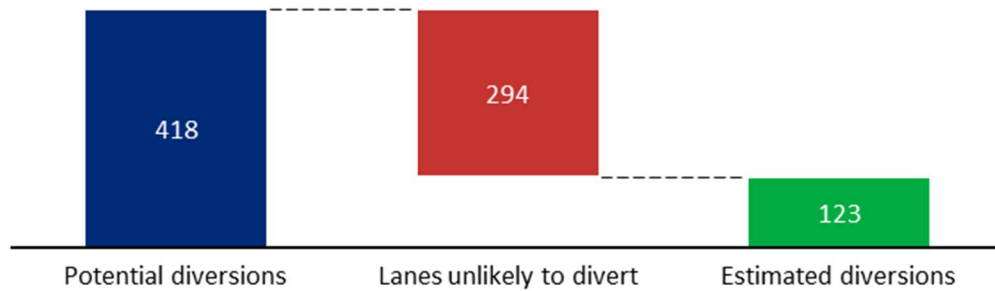
**Exhibit B-17: Example exclusions for finished vehicle lanes unlikely to divert<sup>167</sup>**

| Location               | Reason                                                                                                                                |
|------------------------|---------------------------------------------------------------------------------------------------------------------------------------|
| Tuscaloosa County, AL  | Mercedes-Benz, the OEM at this origin, has a higher sensitivity to transit time and a lower output volume compared to non-luxury OEMs |
| Hamilton County, TN    | Volkswagen, the OEM at this origin, has a contract with CSXT, so unlikely to divert truck volume to UP-NS post-merger                 |
| Spartanburg County, SC | BMW, the OEM at this origin, has a higher sensitivity to transit time and a lower output volume compared to non-luxury OEMs           |
| Talladega County, AL   | Honda, the OEM at this origin, has a contract with CSXT, so unlikely to divert truck volume to UP-NS post-merger                      |
| St. Charles County, MO | Lanes to Kansas City, MO were excluded due to the short distance                                                                      |

<sup>167</sup> Ibid.

After manually filtering out 1,250 lanes unlikely to divert to UP-NS and adding back one lane (Wayne County, MI to Shreveport, LA), which was deemed a prime candidate for diversion, the output is 123,000 tons across 36 county-to-BEA lanes, which is deemed to be the true potential for truck-to-rail finished vehicle diversions (Exhibit B-18). All of the truck tonnage in these lanes was considered as likely to divert.

**Exhibit B-18: Estimated truck-to-rail finished vehicle diversions, based on manual lane analysis<sup>168</sup>**  
Thousands of tons



This more manual approach for estimating truck-to-rail diversions for finished vehicle traffic reflects the unique infrastructure considerations, consolidated shipper landscape, and high drayage costs for finished vehicle traffic compared to intermodal and merchandise/bulk traffic.

Exhibit B-19 shows a price per finished vehicle comparison between truck and rail pre-merger for the same county-to-county flow, where the number of finished vehicles is derived using the following formula:

$$\# \text{ of finished vehicles flowing between county pairs} = (\text{truck tons} + \text{rail tons}) / 2.5 \text{ tons per finished vehicle.}^{169}$$

<sup>168</sup> See workpaper “C-Appendix B Exhibits vFinal.xlsx.”

<sup>169</sup> Based on 2024 preliminary vehicle weight (lbs.) of 4,419 (rounded up to 2.5 tons) as reported in Table 3.1. Vehicle Attributes by Model Year, 2024 Automotive Trends Report, US Environmental Protection Agency, p. 42.

**Exhibit B-19: Finished vehicle traffic: price per finished vehicle, truck vs. rail pre-merger by LOH<sup>170</sup>**  
Average \$/finished vehicle

| Length of haul (miles) | Truck   | Rail (pre-merger) <sup>171</sup> |
|------------------------|---------|----------------------------------|
| 250-499                | \$835   | \$564                            |
| 500-749                | \$1,055 | \$730                            |
| 750-999                | \$1,395 | \$890                            |
| 1,000-1,499            | \$1,875 | \$1,117                          |
| 1,500-1,999            | \$2,513 | \$1,373                          |
| 2,000+                 | \$3,196 | \$1,752                          |

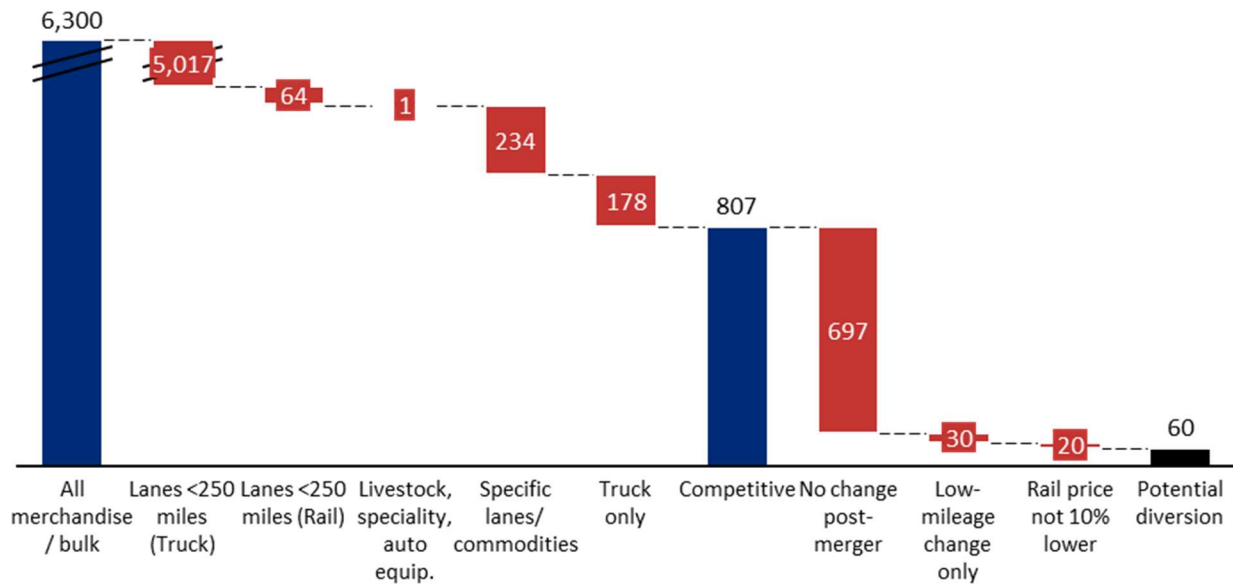
## B.5. Merchandise/Bulk Traffic Analysis

### B.5.1. Addressable Market

Within the merchandise/bulk market, there are an estimated 807 million tons in county-county lanes where both truck and rail compete. An estimated 60 million tons of this competitive market, around 7.5%, has the potential to be diverted by the UP-NS merger.

**Exhibit B-20: Breakdown of addressable merchandise/bulk truck traffic<sup>172</sup>**

Millions of tons



<sup>170</sup> See workpaper “C-Appendix B Exhibits vFinal.xlsx.”

<sup>171</sup> Includes a flat haul-away cost of \$181.42 per finished vehicle derived from revenue per unit of company deliveries reported in Proficient Auto Logistics’ Q3 2025 financial results, op. cit.

<sup>172</sup> Transearch, op. cit.; see workpapers “t2merch\_lookalike\_analysis\_2026\_vFinal.ipynb” and “C-Appendix B Exhibits vFinal.xlsx.”

Estimated diversions were based on eliminating from consideration all truck traffic where:

- Lanes are less than or equal to 250 miles long for both truck and rail;
- Traffic travels on specific truck equipment types that are unlikely to divert to rail. This includes livestock, specialty equipment (which is primarily wet cement trucks), and automotive trucks;
- Upon detailed review of Transearch trucking data and discussions with UP and NS experts, specific lanes and commodities were excluded for various reasons, as shown in Exhibit B-21;
- County-to-county lanes where rail service was not identified (“truck only”) or where the merger would not improve rail service were excluded from the addressable market;
- Lanes that were improved by less than 163 miles with no change in junction frequency were excluded; as 163 miles per day is the average distance for a railcar to travel in one day,<sup>173</sup> and this is not seen as a large enough improvement to attract a shipper to switch from truck to rail service; and
- Lanes where the rail price was <10% better than the truck price were excluded.<sup>174</sup>

Note that is difficult to accurately match Mexican transborder rail traffic to Transearch truck traffic due to data limitations. Thus, this traffic also was excluded from the analysis, which instead focuses on US domestic traffic and Canadian transborder traffic.

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<sup>173</sup> See Appendix B.8: Merchandise/Bulk Train Transit Time.

<sup>174</sup> 1994 Verified Statement of Peter Stone submitted to the Surface Transportation Board; see reference source “FD\_32549\_VS\_Stone\_Reebie\_Truck\_to\_Rail\_Diversion.”

**Exhibit B-21: Specific lane/commodity exclusions from Transearch data**

| Lane                                         | STCC4 | STCC4 Name                                 | Truck equipment type | Tonnage excluded   | Reason                                                                               |
|----------------------------------------------|-------|--------------------------------------------|----------------------|--------------------|--------------------------------------------------------------------------------------|
| Muskegon County, MI to Harris County, TX     | 1441  | Gravel or sand                             | Bulk, Tank           | All                | Per UP Industrial team review                                                        |
| Harris County, TX to Philadelphia County, PA | 2815  | Cyclic Intermediates or Dyes               | Bulk, Tank           | All                |                                                                                      |
| Harris County, TX to Jasper County, SC       |       |                                            |                      |                    |                                                                                      |
| Nueces County, TX to Richland County, SC     |       |                                            |                      |                    |                                                                                      |
| Nueces County, TX to Philadelphia County, PA |       |                                            |                      |                    |                                                                                      |
| All                                          | 1471  | Chem or fertilizer minerals, crude         | Bulk                 | All                | Primarily WY soda ash manufacturing originations; assumed to be false transload data |
| All                                          | 0131  | Bulbs, roots & tubers                      | All                  | All                | Refrigerated commodity, considered out of scope for truck diversion                  |
| All                                          | 2021  | Creamery butter                            | All                  | All                |                                                                                      |
| All                                          | 2016  | Frozen dressed poultry                     | All                  | All                |                                                                                      |
| All                                          | 2036  | Fresh or frozen packaged fish              | All                  | All                |                                                                                      |
| All                                          | 0912  | Fish & whale product including frozen      | All                  | All                |                                                                                      |
| All                                          | 0122  | Deciduous fruits                           | All                  | All                |                                                                                      |
| All                                          | 2092  | Soybean oil or by-products                 | Bulk, Tank           | All                | Per UP Bulk team review                                                              |
| All                                          | 0113  | Grain                                      | Bulk, Tank           | All                |                                                                                      |
| All                                          | 2813  | Industrial gases                           | All                  | 50% of all tonnage | Per UP Industrial team review                                                        |
| All                                          | 2818  | Miscellaneous industrial organic chemicals | All                  | 50% of all tonnage |                                                                                      |
| All                                          | 2821  | Plastic matter or synthetic fibers         | All                  | 50% of all tonnage |                                                                                      |

Transearch data defines any truck with temperature control components as a reefer truck type; however, many of these trucks are more accurately defined as other truck types based on the type of railcar which that commodity would travel in. The commodities in reefer truck types in Exhibit B-22 were modified to be listed as moving in more representative truck types after review of the typical railcars transporting these commodities.

**Exhibit B-22: Specific reefer truck overrides from Transearch data**

| Lane | STCC4 | STCC4 name                   | Transearch truck type | Updated truck type |
|------|-------|------------------------------|-----------------------|--------------------|
| All  | 2046  | Wet corn milling or milo     | Reefer                | Tank               |
| All  | 2082  | Malt liquors                 | Reefer                | Dry van            |
| All  | 2062  | Sugar, refined, cane or beet | Reefer                | Bulk               |

## **B.5.2. Model Methodology**

### ***A. Truck and rail traffic matching***

Truck traffic from Transearch and rail traffic from 100% waybill data were matched to create a merchandise truck and rail database, where each row represents a single county-county-STCC2 commodity lane. Data was rolled up from the STCC6 or STCC7 level in the 100% waybill data and from the STCC4 level in Transearch to create comparable data at the STCC2 level.

Transearch reports truck traffic with both commodities and truck equipment types, which was necessary to calculate a representative truck price. To spread the rail tonnage in that lane, it was assumed the spread of a commodity's truck tons across equipment types would be the same for rail. An illustrative example of this spread is outlined in Exhibit B-23.

**Exhibit B-23: Illustrative example of spreading rail traffic across truck equipment types<sup>175</sup>**

| CRA   |       |       |           | Combined merchandise truck and rail database |       |       |                      |            |           |
|-------|-------|-------|-----------|----------------------------------------------|-------|-------|----------------------|------------|-----------|
| OFIPS | DFIPS | STCC2 | Rail tons | OFIPS                                        | DFIPS | STCC2 | Truck equipment type | Truck tons | Rail tons |
| 12345 | 22345 | 20    | 200       | 12345                                        | 22345 | 20    | Dry Van              | 50         | 100       |
| 12345 | 22345 | 14    | 20        | 12345                                        | 22345 | 20    | Reefer               | 50         | 100       |
| 12345 | 22345 | 11    | 30        | 12345                                        | 22345 | 14    | Bulk                 | 100        | 20        |
| 12345 | 22345 | 28    | 50        | 12345                                        | 22345 | 11    | Bulk                 | 100        | 30        |
|       |       |       |           | 12345                                        | 22345 | 28    | Tank                 | 100        | 50        |

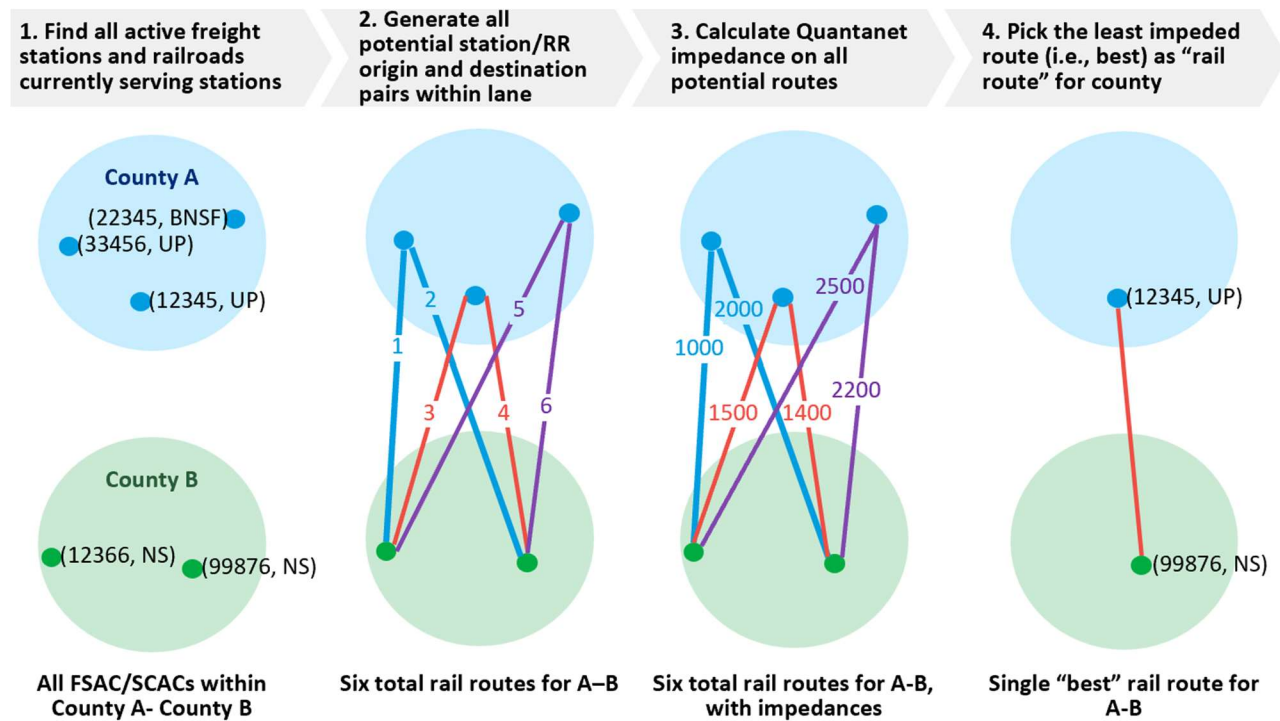
### ***B. Rail county-county mileage***

Because Transearch is at the county-to-county breakdown, a single rail route for each county-county lane is required to compare to the truck route. To get a single rail route, the “best route” available was chosen; thus, if a shipper chooses truck over rail, it is assumed to be because the truck route is a more attractive option over all rail routes available in that county.

To do so, for every county-county pair, as shown in Exhibit B-24, every possible rail route option in that lane was generated, using the rail mileage program described in Appendix A.6. The “best route,” which is defined as the lowest impended route, was then selected. This process was completed twice – once to create the pre-merger network, and a second time to create the post-merger network. Where the UP-NS merger would improve service in certain lanes, that becomes a better route within that county to compete against truck options.

<sup>175</sup> Illustrative example of analysis within workbook “MerchBuildAll\_2026\_vFinal.sql.”

**Exhibit B-24: Illustrative process to choose a single rail route for each county-to-county lane**



### C. Lookalike model to estimate diversions

To estimate merchandise truck diversions, a lane lookalike analysis was used. The assumption is that rail lanes with similar characteristics will have a similar rail market share. Lane "archetypes" were created based on similar characteristics; these archetypes were built off the all county-county routes where both rail and truck have competing service (see Exhibit B-20 for the size of this set). These "competitive" county-county routes were then grouped into county-county-STCC2 lanes and into different "archetypes" based on similar characteristics.

As the UP-NS merger would improve service in specific lanes, it would shift some of these improved lanes into a different archetype. It is assumed that lanes post-merger could be applied to the same rail market share as pre-merger. This lookalike analysis was performed across each of the five truck types as provided by Transearch: bulk, reefer, dry van, tanker, and flatbeds.

**Lane archetypes:** four key characteristics were used to group lanes into archetypes: rail mileage, rail transit hours, rail price, and single-line/interline service. As a backup, a simplified archetype also was created, based on rail mileage and the distinction between single-line and interline service. This simplified archetype was used only when an improved lane post-merger fell into a new primary archetype that was not previously defined. This simplified archetype was used for only 55 lanes.

To create the archetypes, different “bins” were applied for each characteristic:

- Interline vs. single-line-service potential: if a railroad can serve both the origin and destination county, single-line-service is theoretically available.
- Rail mileage was split into 250-mile increments: 250-499, 500-749, 750-999, 1000-1249, 1250-1499, 1500-1749, 1750-1999, 2000+.
- Rail transit hours were split into 15-hour increments, with bottom bin <50 miles, and top bin 350+ miles; 15 hours roughly equates to 163 car-miles based on agency sources (see “Rail Transit Time” section). I believe that a 163 car-mile difference is a large enough change that shippers might reconsider their shipping mode choice.
- Rail price bins were calculated separately for each truck equipment type. The average price difference between pre-merger and post-merger prices within an equipment type was used to determine bin sizes, given that pricing is the most significant difference between equipment types (see Exhibit B-25).

**Exhibit B-25: Average rail price (revenue per ton-mile) difference between pre- and post-merger by truck equipment type<sup>176</sup>**

| Equipment type | Avg. rail price difference |
|----------------|----------------------------|
| Bulk           | \$0.012                    |
| Reefer         | \$0.011                    |
| Dry van        | \$0.011                    |
| Tank           | \$0.012                    |
| Flatbed        | \$0.013                    |

A range of 66-236 unique archetypes was used across the five truck types. The average rail market share for each of these archetypes comprises a set of current-state competitive lanes. The average number of lanes in each archetype ranges between 864 and 2,611 lanes across the five truck types, which provides confidence that the archetypes are representative. Low-observation archetypes (less than 30 observations) involve only 3,581 diverted carloads. See Exhibit B-26 for a summary of this performance. The robustness of these archetypes provides strong confidence in the outputs of this analysis.

**Exhibit B-26: Truck to rail carload, merchandise/bulk archetype robustness<sup>177</sup>**

| Equipment type | # of unique archetypes used | Avg. observations per archetype | # of archetypes comprising <30 observations | Diverted carloads attributed to these <30 observations |
|----------------|-----------------------------|---------------------------------|---------------------------------------------|--------------------------------------------------------|
| <b>Bulk</b>    | 198                         | 1,170                           | 11                                          | 139                                                    |
| <b>Dry van</b> | 236                         | 2,611                           | 5                                           | 20                                                     |
| <b>Reefer</b>  | 66                          | 864                             | 2                                           | 2                                                      |
| <b>Tank</b>    | 236                         | 1,218                           | 9                                           | 102                                                    |
| <b>Flatbed</b> | 187                         | 540                             | 10                                          | 3,335                                                  |

**Market share estimation:** The average rail market share for each archetype was calculated based on all the lanes categorized within that archetype pre-merger. This average was weighted by total market tons (defined as rail + truck tons within that lane). By doing this, higher volume

<sup>176</sup> See workpaper “t2merch\_lookalike\_analysis\_2026\_vFinal.ipynb.”

<sup>177</sup> See workpaper “HC-Lookalike Market Share vFinal.xlsx.”

traffic lanes will exert a greater influence on an archetype's average rail market share, under the assumption that market dynamics are more consistent with increased volume.

This current-state average market share by archetype was then directly applied to post-merger lanes, reflecting the new archetype classification following expected UP-NS improvements. Consequently, most lanes that would be enhanced by the UP-NS merger would transition to a new archetype, often characterized by a higher rail market share.

**Diversion calculation:** For lanes improved by the UP-NS merger, the estimated rail market size post-merger was calculated by multiplying the estimated rail market share by the current total market size. Potentially divertible traffic was determined by subtracting current-state rail tons from estimated rail tons post-merger.

After a review of these quantitatively driven diversions, some diverted traffic was excluded to better reflect what traffic would realistically be converted:

- In many cases, truck traffic is being diverted in the model to rail in counties where the potential for rail service exists today, but UP-NS does not have any existing traffic. In some of these cases, the rail volume being diverted is so low that UP-NS would not realistically begin service. Thus, if the origin county did not show at least two carloads a week of existing plus diverted traffic in the model, the diversion was excluded.
- The model excluded diversion opportunities to and from South Dakota, Montana, and North Dakota, which are currently sole served by short lines but that UP can access. These diversions were excluded because converting this traffic is complex and would rely on short-line partnerships, which is out of scope for this analysis.

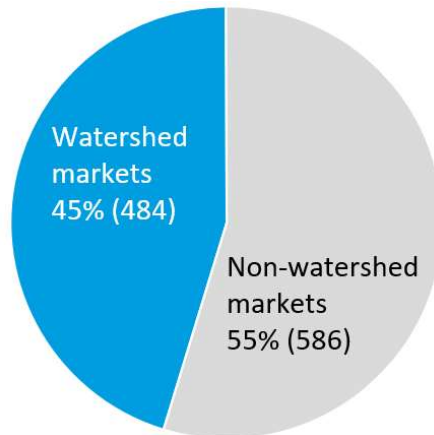
Diverted traffic calculated in tons (given the comparison to truck traffic) was then converted to railcar units. From the Public Use Waybill Sample, tons per railcar were calculated for each STCC2 commodity and this conversion applied to the diversions.<sup>178</sup>

### B.5.3. Watershed Region Definition

Watershed markets are defined as inter-watershed and intra-watershed lanes. These lanes accounted for 45% of merchandise/bulk truck and rail traffic in 2023, while non-watershed lanes accounted for 55% (Exhibit B-27).

**Exhibit B-27: Watershed vs. non-watershed merchandise/bulk markets<sup>179</sup>**

Millions of tons, US total = 1,071 million tons



To observe the relative impact on merchandise/bulk traffic in/across the watershed compared to the rest of the US, existing lanes and estimated diversions were categorized into one of four lane types:

- **Inter-watershed:** a lane either originating or terminating in the watershed region;
- **Intra-watershed:** a lane both originating and terminating in the watershed region;

<sup>178</sup> Public Use Waybill Sample, op. cit.; see database table “t2r\_2026.2023\_tons\_per\_car\_PUWS.”

<sup>179</sup> See workpaper “t2merch\_watershed\_summary\_2026\_vFinal.ipynb.”

- **Cross-watershed:** a lane originating east of the watershed and terminating west of the watershed or a lane originating west of the watershed and terminating east of the watershed; and
- **All east or all west:** a lane that originates and terminates in either west or east.

The watershed was defined by identifying counties that fall within a 250-mile radius of one of four key gateways: Chicago, St. Louis, Memphis, and New Orleans, as shown in Exhibit 4-8.<sup>180</sup> This range was selected to capture traffic at these four major interchange points at the convergence of existing US rail networks, as well as shippers located in and around these gateways. All US counties outside these radii were then assigned a designation of east or west, based on which side of the watershed they fall. These county designations were used to categorize all lanes for both existing traffic and calculated estimated diversions for the four lane types, by determining in which county each lane originates and terminates.

#### **B.5.4. Rail Performance vs. Truck**

##### ***A. Single-line vs. interline performance compared to truck***

To determine rail’s performance against trucking on routes with single line vs. only interline service available, all “competitive” county-county merchandise lanes that are served by both rail and truck today were analyzed. The exclusions that have been applied to these “competitive” lanes are explained in Section B.5.1 “Addressable Market”

The best rail option available (as defined in Section B.3.) in each competitive lane was classified as either single-line service or interline service. To focus on linehaul move and avoid noise created by switching carriers, reciprocal switches and shortlines, the following tables define single-line and interline based on the number of Class I railroads in the best route. Single-

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<sup>180</sup> A full list of counties included in this watershed region are available in the database “t2r\_2026.fips\_250mi\_eway\_watershed.”

line is where the route only has one Class I railroad. By the current-state rail length of haul, truck and rail tons were added across single-line vs. interline lanes. The rail market share is *rail tons divided by total rail + truck market tons*. The results in Exhibit B-28 show that rail is much less competitive against truck in lanes where only interline service is available to shippers.

**Exhibit B-28: Rail performance across merchandise lanes, where single-line service vs. only interline service is available today<sup>181</sup>**

| Rail LOH  | Single-line service available: truck tons (millions) | Single-line service available: rail tons (millions) | Single-line service available: rail market share | Only interline service available: truck tons (millions) | Only interline service available: rail tons (millions) | Only interline service available: rail market share |
|-----------|------------------------------------------------------|-----------------------------------------------------|--------------------------------------------------|---------------------------------------------------------|--------------------------------------------------------|-----------------------------------------------------|
| 250-499   | 257.7                                                | 110.2                                               | 30%                                              | 84.2                                                    | 15.3                                                   | 15%                                                 |
| 500-749   | 108.8                                                | 80.1                                                | 42%                                              | 49.0                                                    | 19.7                                                   | 29%                                                 |
| 750-999   | 59.0                                                 | 90.3                                                | 61%                                              | 37.5                                                    | 29.3                                                   | 44%                                                 |
| 1000-1499 | 54.9                                                 | 73.3                                                | 57%                                              | 58.1                                                    | 43.5                                                   | 43%                                                 |
| 1500-1999 | 25.4                                                 | 48.7                                                | 66%                                              | 20.1                                                    | 15.5                                                   | 43%                                                 |
| 2000+     | 14.4                                                 | 15.5                                                | 52%                                              | 38.3                                                    | 13.1                                                   | 26%                                                 |

***B. Single-line vs. interline performance compared to truck in the watershed***

To evaluate merchandise rail performance against truck specifically within the watershed, the same analysis was conducted as done across all merchandise lanes but then split additionally by the four watershed lane types (cross watershed, inter-watershed, intra-watershed, and all east/west; see Section B.5.3 “Watershed Region Definition” for lane-type definitions). The results reenforce that single-line service consistently outperforms interline service – in and out of the watershed (Exhibit B-29).

<sup>181</sup> See workpaper “t2merch\_watershed\_summary\_2026\_vFinal.ipynb.”

**Exhibit B-29: Rail performance across merchandise lanes where single-line service vs. only interline service is available today, by lane type<sup>182</sup>**

| Lane type       | Single-line service available: truck tons (millions) | Single-line service available: rail tons (millions) | Single-line service available: rail market share | Only interline service available: truck tons (millions) | Only interline service available: rail tons (millions) | Only interline service available: rail market share |
|-----------------|------------------------------------------------------|-----------------------------------------------------|--------------------------------------------------|---------------------------------------------------------|--------------------------------------------------------|-----------------------------------------------------|
| Cross-watershed | 1.5                                                  | 0.8                                                 | 33%                                              | 66                                                      | 20                                                     | 23%                                                 |
| Inter-watershed | 157.9                                                | 70                                                  | 31%                                              | 116.8                                                   | 30.7                                                   | 21%                                                 |
| Intra-watershed | 38.3                                                 | 18.3                                                | 32%                                              | 44.8                                                    | 7.1                                                    | 14%                                                 |
| All east/west   | 322.6                                                | 110.2                                               | 25%                                              | 59.5                                                    | 5.6                                                    | 9%                                                  |

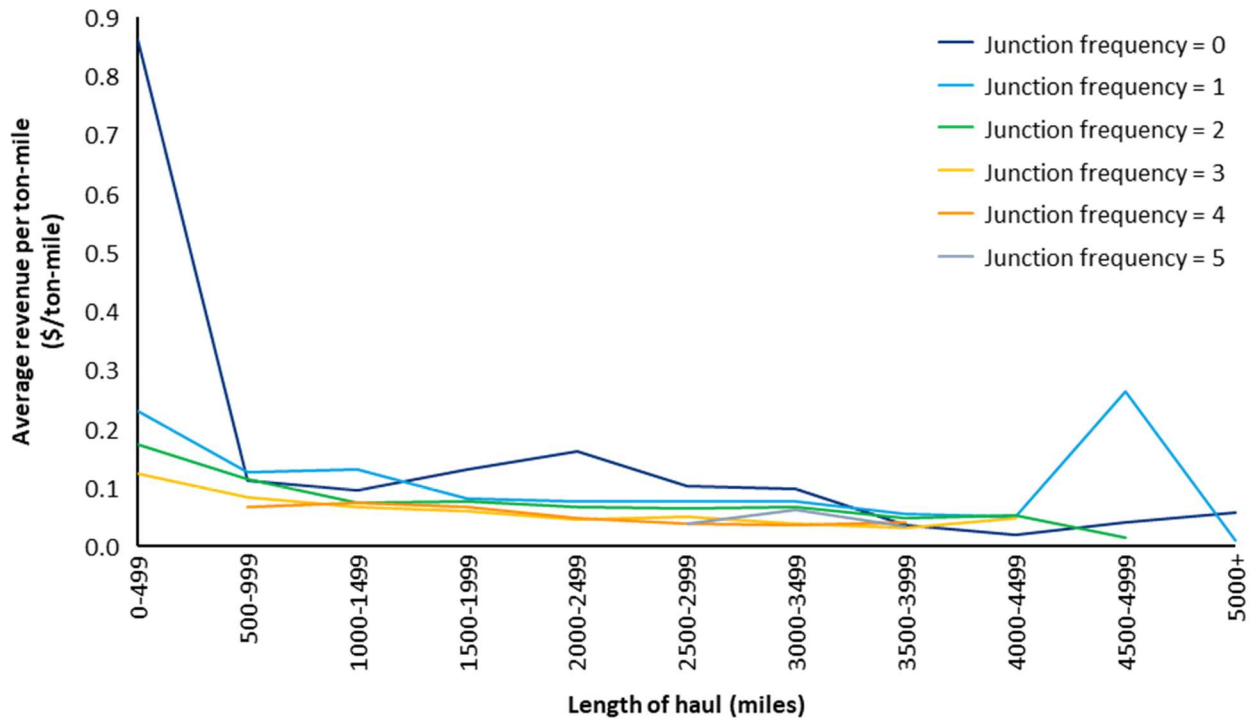
## B.6. Merchandise/Bulk Price Methodology

To estimate the cost per ton-mile for a merchandise train haul, data from the 2023 CCWS was used. This is the most comprehensive and accurate source for rail pricing data in the industry, as it contains expanded revenue, expanded tons, and mileage information representative of all 2023 waybills. While the revenue per ton-mile figures from CCWS could be directly applied as a pricing lookup, the data also includes commercial considerations, which resulted in inexplicable increases in revenue per ton-mile as the rail mileage increased when all other factors were held constant, despite common industry knowledge suggesting an inverse relationship between these two variables (see Exhibit B-30).

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<sup>182</sup> Ibid.

**Exhibit B-30: CCWS average revenue per ton-mile for all STCC2 commodities and service types by length of haul and junction frequency<sup>183</sup>**



Due to these abnormalities seen in the raw CCWS data, the price curve was smoothed so that it reflects more logical behaviors and real-world pricing patterns. To produce new revenue per ton-mile curves for merchandise train types, a power-law regression was used to regress revenue per ton-mile onto rail mileage for all CCWS merchandise train waybill records (service type = 1) not billed as a Rule 11 shipment (rebill code = 0).

This regression was performed three times – once on waybills with no junction frequency (i.e., single-line service), a second time on waybills with one junction frequency, and a third time on all remaining waybills with two or more junction frequencies. It was assumed that when all other variables are held constant, revenue per ton-mile will be the same for all merchandise train hauls with two or more interchanges. This assumption was adopted because the CCWS dataset

<sup>183</sup> See workpaper “HC-CCWS-Rail Rev per Ton Mile by STCC2.xlsx.”

contains very few records with more than two junction frequencies, so there was insufficient data to justify fitting a regression curve for these waybills (Exhibit B-31).

**Exhibit B-31: Number of records and expanded cars in CCWS by junction frequency<sup>184</sup>**

| # of junction frequencies | Count of waybill records | # of expanded cars |
|---------------------------|--------------------------|--------------------|
| 0                         | 1,880,986                | 30,645,562         |
| 1                         | 203,759                  | 2,261,278          |
| 2                         | 23,044                   | 237,061            |
| 3                         | 812                      | 4,240              |
| 4                         | 8                        | 40                 |

Because these regressions were not done at a commodity-specific level, CCWS revenue per ton-mile for each STCC2 commodity was indexed to the overall average revenue per ton-mile across all STCC2s to get a commodity-specific adjustment ratio. Given CCWS revenues account for tariff rates, another revenue adjustment ratio was applied based on the revenue per ton-mile reported by the 2023 FCS for each STCC2, to more accurately capture the rate that shippers pay.

After all revenue adjustments were applied, a table of revenue per ton-mile by STCC2 commodity, length of haul (100-mile increments), and junction frequency was produced, to be used as a lookup to match revenue per ton-mile values to each merchandise train move. The resulting revenue per ton-mile curves averaged across all STCC2 commodities are summarized in Exhibit B-32.

<sup>184</sup> See workpaper “C-Appendix B Exhibits vFinal.xlsx.”

**Exhibit B-32: Adjusted CCWS revenue per ton-mile averaged across all commodities by length of haul and junction frequency for merchandise trains<sup>185</sup>**

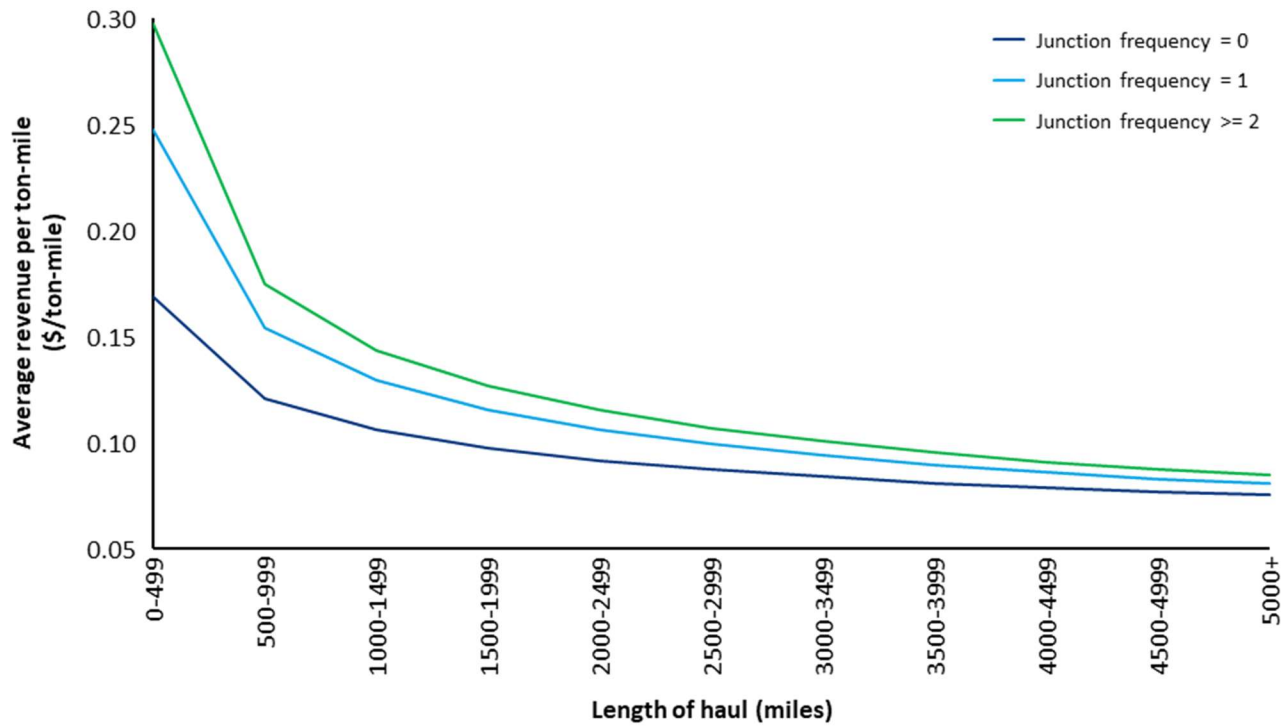
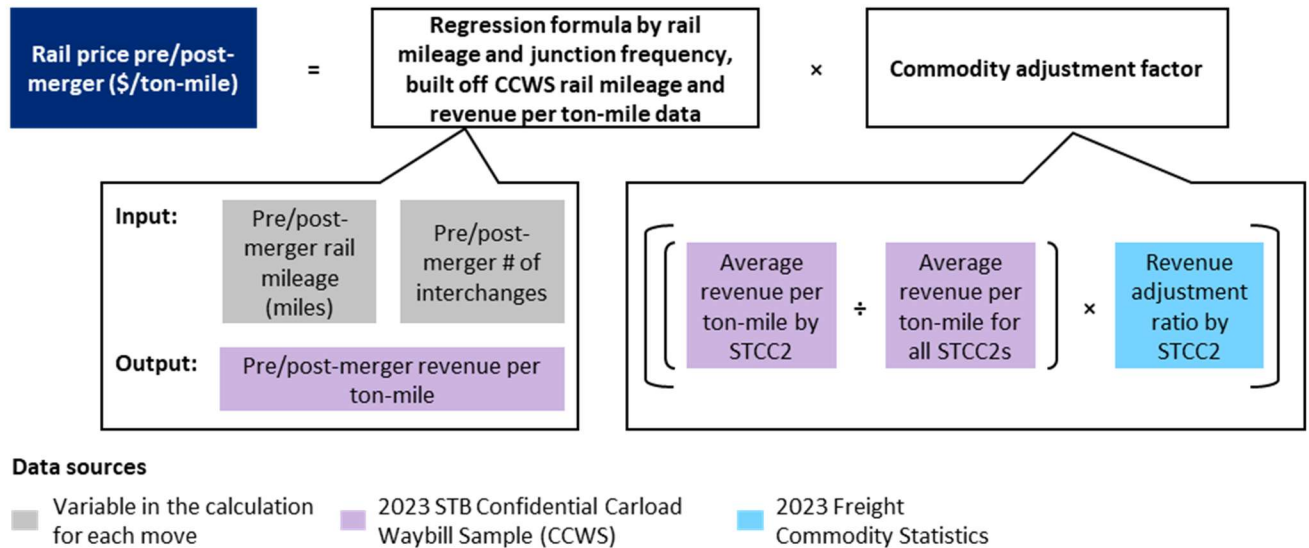


Exhibit B-33 depicts the entire rail price estimation process for merchandise trains, Exhibit B-34 shows summarized outputs of average rail price per ton-mile for merchandise trains pre-merger by length of haul.

<sup>185</sup> See workpaper “C-Revised Revenue per Ton Mile.xlsx.”

**Exhibit B-33: Process used to estimate rail price per ton-mile pre/post-merger for merchandise trains**



**Exhibit B-34: Summarized outputs of average price per ton-mile for merchandise trains pre-merger by length of haul for merchandise/bulk traffic<sup>186</sup>**

| Rail length of haul (miles) | Avg. price per ton-mile pre-merger for merchandise trains |           |
|-----------------------------|-----------------------------------------------------------|-----------|
|                             | Single-line                                               | Interline |
| 250-499                     | 0.089                                                     | 0.114     |
| 500-749                     | 0.081                                                     | 0.101     |
| 750-999                     | 0.077                                                     | 0.094     |
| 1000-1499                   | 0.07                                                      | 0.085     |
| 1500-1999                   | 0.065                                                     | 0.074     |
| 2000+                       | 0.059                                                     | 0.063     |

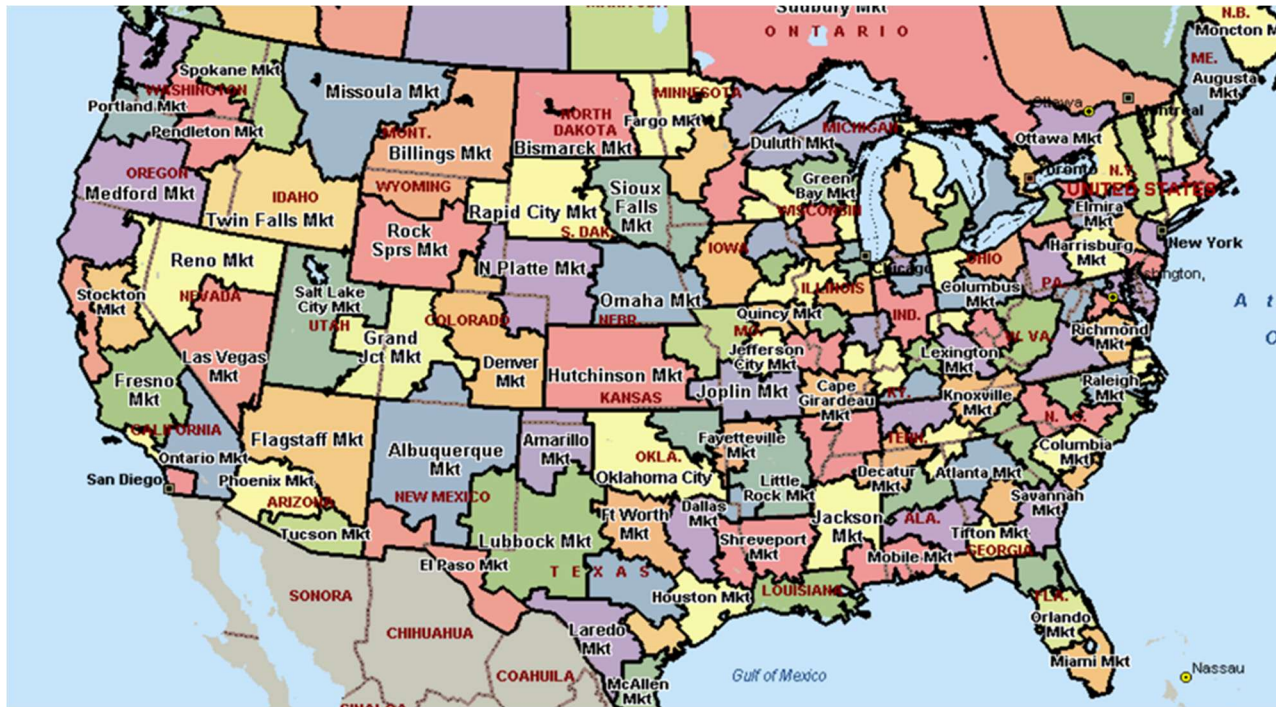
## B.7. Truck Price Assumptions

To estimate the cost per ton-mile for a truck haul, data purchased from DAT Freight & Analytics (“DAT”) was used, which details average spot and contract rates for the 10,000 highest volume US dry van lanes for 2023. DAT is North America’s largest truckload freight marketplace and leads the industry in freight data analytics. DAT dry van rate per-mile is

<sup>186</sup> See workpaper “C-Appendix B Exhibits vFinal.xlsx.”

provided at the key market area (“KMA”) lane level, where each origin and destination key market area is defined as a combination of multiple 3-digit ZIP code regions (Exhibit B-35).

**Exhibit B-35: DAT key market areas (KMAs)**



To match DAT lanes with Transearch lanes, which are defined at the more granular county level, the origin and destination KMAs were mapped to their corresponding counties, and the same spot/contract rates were assigned to every lane that originated and terminated in counties contained within each origin-destination KMA pair.

Since DAT only includes rates for US-based lanes and there is no comparable source for transborder trucking, truck rates to/from Canada or Mexico were estimated using DAT’s average rates by length of haul. For any lanes lacking DAT pricing, spot and contract rates were estimated using group averages by length-of-haul (LOH) across all county-to-county lanes with DAT rate data, after mapping KMAs to counties (Exhibit B-36).

**Exhibit B-36: Average DAT contract and spot rate per mile by length of haul for merchandise/bulk traffic<sup>187</sup>**

| Length of haul (miles) | Average contract rate per mile (\$/mile) for dry vans | Average spot rate per mile (\$/mile) for dry vans |
|------------------------|-------------------------------------------------------|---------------------------------------------------|
| 250-499                | \$4.211                                               | \$4.210                                           |
| 500-749                | \$1.830                                               | \$1.830                                           |
| 750-999                | \$1.710                                               | \$1.711                                           |
| 1000-1499              | \$1.585                                               | \$1.586                                           |
| 1500-1999              | \$1.505                                               | \$1.506                                           |
| 2000+                  | \$1.332                                               | \$1.333                                           |

Once a dry van contract/spot rate per mile had been matched to every Transearch county-to-county lane, a dry van cost per-mile was calculated using the formula below:

$$\text{Dry van cost per mile for lane} = (\text{average spot rate for lane} + \text{average contract rate for lane})/2 + \$0.44 \text{ per mile of average fuel surcharge rate}$$

Since DAT only carries rate per mile information for dry vans, those rates were adjusted to represent the broader set of truck equipment in Transearch, by applying various truck cost to dry van cost ratios reported by the American Transportation Research Institute (“ATRI”) to more accurately reflect prices for the different truck equipment types contained in Transearch (Exhibit B-37). In my experience, ATRI is another data source that provides credible and useful insights on trucking costs. ATRI average operating costs per mile include short- and long-haul trucking and fuel costs.

**Exhibit B-37: ATRI 2023 average respondent total cost per mile by type of truck<sup>188</sup>**

| Transearch truck type | Equivalent ATRI truck type | Total cost per mile, \$ reported by ATRI | Cost to dry van ratio |
|-----------------------|----------------------------|------------------------------------------|-----------------------|
| Tank – liquid bulk    | Tanker                     | \$3.87                                   | 1.33                  |
| Refrigerated          | Refrigerated van           | \$3.41                                   | 1.17                  |
| Flatbed               | Flatbed/oversize           | \$3.29                                   | 1.13                  |
| Bulk                  | Flatbed/oversize           | \$3.29                                   | 1.13                  |
| Dry van               | Truckload dry van          | \$2.92                                   | 1.00                  |

<sup>187</sup> See workpaper “Truck price per mile vFinal.ipynb.”

<sup>188</sup> Source: ATRI-Operational-Cost-of-Trucking-06-2024.pdf. Figure 24, revenue less operating margin.

While ATRI reports total cost per mile information on most truck types, it does not report on automotive hauler cost per mile figures. As such, the ratio of automotive hauler cost to dry van cost was derived separately using 10-K filings from 2024 Proficient Auto Logistics (“PAL”), a publicly traded auto-hauler company that has one of the largest auto transportation fleets in North America (Exhibit B-38).

**Exhibit B-38: Proficient Auto Logistics reported 2023 miles driven and operating expenses<sup>189</sup>**

10-K filings for the year ended Dec 31, 2024

| Total operating expenses in 2023 | Total # miles driven in 2023 | Approximate total cost per mile | ATRI dry van total cost per mile | Automotive cost to dry van cost ratio |
|----------------------------------|------------------------------|---------------------------------|----------------------------------|---------------------------------------|
| \$125,402,539                    | 10,000,000                   | \$12.54                         | \$2.92                           | 4.30                                  |

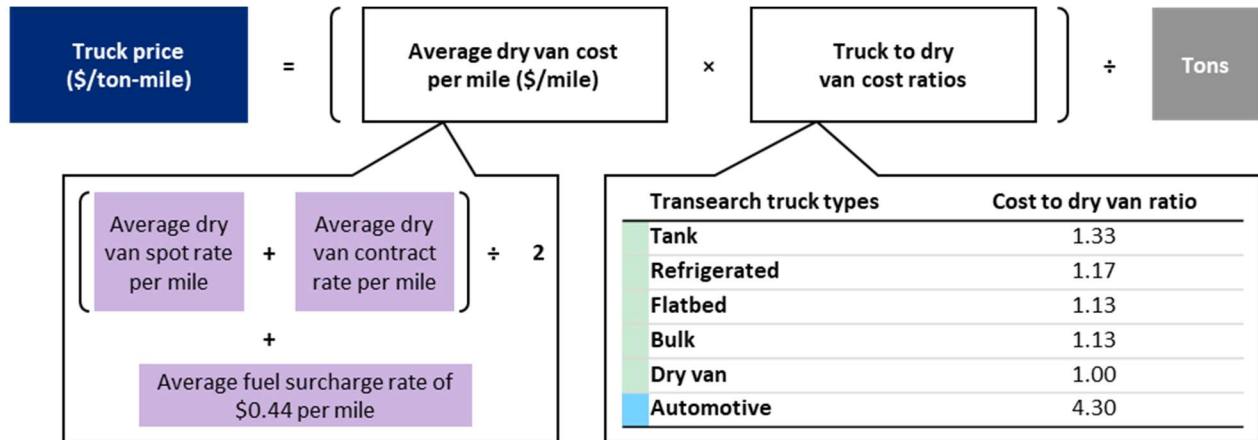
The final step to calculate truck cost per ton-mile is as follows:

*Truck cost per ton-mile = truck cost per-mile derived from DAT ÷ total truck tons in each county-to-county lane*

Exhibit B-39 depicts the entire truck price estimation process, Exhibit B-40 shows summarized outputs of the truck price per mile by length of haul, and Exhibit B-41 shows summarized outputs of the truck price per ton-mile by length of haul.

<sup>189</sup> Source: Form 10-K for Proficient Auto Logistics.pdf.

**Exhibit B-39: Process used to estimate truck price per ton-mile**



**Data sources**

Variable in the calculation for each move
  DAT Freight & Analytics
  Proficient Auto Logistics 2024 10-K filings
  American Transportation Research Institute (ATRI)

**Exhibit B-40: Summary output for average truck price per mile by truck equipment type and length of haul for merchandise/bulk traffic<sup>190</sup>**

| LOH (miles) | Automotive | Bulk   | Dry van | Flatbed | Refrigerated | Tank   |
|-------------|------------|--------|---------|---------|--------------|--------|
| 250-499     | \$6.00     | \$3.11 | \$2.70  | \$3.05  | \$3.12       | \$3.53 |
| 500-749     | \$5.92     | \$2.57 | \$2.30  | \$2.58  | \$2.68       | \$3.04 |
| 750-999     | \$6.56     | \$2.47 | \$2.21  | \$2.48  | \$2.62       | \$2.90 |
| 1000-1499   | \$7.44     | \$2.39 | \$2.14  | \$2.42  | \$2.57       | \$2.83 |
| 1500-1999   | \$8.49     | \$2.37 | \$2.12  | \$2.46  | \$2.48       | \$2.84 |
| 2000+       | \$7.29     | \$2.13 | \$1.90  | \$2.17  | \$2.20       | \$2.55 |

**Exhibit B-41: Summary output for average truck price per ton-mile by truck equipment type and length of haul for merchandise/bulk traffic<sup>191</sup>**

| LOH (miles) | Automotive | Bulk   | Dry van | Flatbed | Refrigerated | Tank   |
|-------------|------------|--------|---------|---------|--------------|--------|
| 250-499     | \$0.43     | \$0.15 | \$0.12  | \$0.16  | \$0.14       | \$0.17 |
| 500-749     | \$0.43     | \$0.12 | \$0.10  | \$0.14  | \$0.12       | \$0.15 |
| 750-999     | \$0.47     | \$0.11 | \$0.10  | \$0.14  | \$0.11       | \$0.14 |
| 1000-1499   | \$0.54     | \$0.11 | \$0.10  | \$0.14  | \$0.11       | \$0.14 |
| 1500-1999   | \$0.61     | \$0.11 | \$0.10  | \$0.14  | \$0.11       | \$0.14 |
| 2000+       | \$0.53     | \$0.10 | \$0.09  | \$0.12  | \$0.10       | \$0.12 |

<sup>190</sup> See workpaper “C-Appendix B Exhibits vFinal.xlsx.”

<sup>191</sup> Ibid.

## B.8. Merchandise/Bulk Train Transit Time

Merchandise/bulk rail transit time is calculated as the customer pick-up to customer drop-off transit time for a given shipment. Rail transit time is estimated in hours for both pre- and post-merger scenarios, with the key assumption for weekly average car-miles per day taken from data reported publicly to the Board in Docket No. EP 770 (Sub-No. 1). This proceeding required all Class I rail carriers to temporarily submit two broad categories of data (rail service and employment) starting in 2022. The Board ended the service data reporting component after December 31, 2023.

CSXT data was excluded, given the reported weekly average number of car-miles per day was abnormally low across all car ownership types when compared to other Class I railroads (Exhibit B-42). Also excluded was any data reported as TTX-owned car types when calculating merchandise train velocity, given the TTX fleet consists primarily of intermodal railcars that travel at much faster speeds than merchandise railcars.

**Exhibit B-42: Comparison of 2023 weekly average number of car-miles per day by railroad and car ownership type<sup>192</sup>**

| Ownership type | CSXT | Average across all other Class I's |
|----------------|------|------------------------------------|
| Private        | 51   | 161                                |
| Railroad       | 80   | 166                                |
| TTX            | 114  | 217                                |

Using this official data collected by the Board in 2023 across all railroads, excluding CSXT, a weekly average of car-miles per day for private and railroad-owned cars was computed, weighted by weekly average number of cars per day in service with mileage, to arrive at an estimated 163 car-miles per day. While railroads have different methodologies to calculate

<sup>192</sup> See workpaper “EP770 and EP724 Summary.xlsx.”

average car miles per day, this value typically represents an all-encompassing operating metric that takes into account the train speed from origination yard to destination yard, as well as the time that the railcar spends in a yard; this is comparable to the activities included in the truck transit time explained in Section B.9. Exhibit B-43 shows the detailed methodology for the weighted average calculation.

**Exhibit B-43: Weighted average calculation of 2023 car-miles per day for all railroads<sup>193</sup>**

| Ownership type | Weekly average number of cars per day in service with mileage | % of total cars per day in service (excl. TTX) | Weekly average number of car-miles per day | Weighted average number of car-miles per day                                             |
|----------------|---------------------------------------------------------------|------------------------------------------------|--------------------------------------------|------------------------------------------------------------------------------------------|
| Private        | 30,290                                                        | 69%                                            | 161.39                                     | (69% × 161.39 car miles/day)<br>+<br>(31% × 166.20 car miles/day)<br>= 163 car miles/day |
| Railroad       | 13,604                                                        | 31%                                            | 166.20                                     |                                                                                          |

Because the car-miles per day reported in EP770 (Sub-No. 1) already include all move dwell times (e.g., train reclassification, crew changes, block swapping), no further dwell time was added to transit duration. However, to more realistically capture terminal operations at the origin and destination, a two-hour warehouse handling time was added to every rail haul to reflect loading and unloading times, based on a commercial review with UP and NS.

For interline moves, additional interchange dwell must be accounted for at each junction. I therefore drew on railroad performance data reported to the Board under 49 CFR part 1250 (which requires Class I carriers to report specified service metrics) and applied the 2023 average system terminal dwell time of 22 hours (excluding cars on run-through trains) as the estimate of time spent at each interchange. Exhibit B-44 summarizes the key expert assumptions made when calculating merchandise train transit time, and Exhibit B-45 depicts the entire rail transit time

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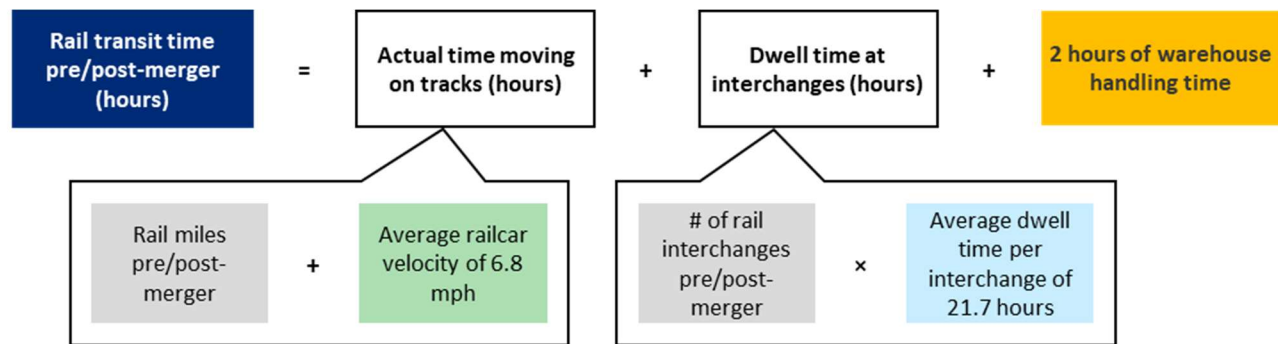
<sup>193</sup> Ibid.

estimation process. Comparisons of the average rail transit times pre and post-merger are summarized in Exhibit B-46.

**Exhibit B-44: Summary of Oliver Wyman expert assumptions when calculating merchandise train transit time<sup>194</sup>**

| Metric                                       | Assumed value     | Source                                                                                                                   |
|----------------------------------------------|-------------------|--------------------------------------------------------------------------------------------------------------------------|
| <b>Merchandise railcar velocity</b>          | 163 miles per day | 2023 weighted average car-miles per day for all railroads (excluding CSXT and TTX car types) reported to the STB (EP770) |
| <b>Warehouse handling time<sup>195</sup></b> | 2 hours           | Based on OW experience working with trucking carriers                                                                    |
| <b>Average dwell time per interchange</b>    | 22 hours          | 2023 average system terminal dwell time (excluding cars on run-through trains) reported to the STB (49 C.F.R part 1250)  |

**Exhibit B-45: Process used to estimate rail transit time pre and post-merger**



**Data sources**

■ Variable in the calculation for each move

■ 2023 average system terminal dwell time (excluding cars on run-through trains) reported to the STB under 49 CFR part 1250

■ Oliver Wyman expert assumption

■ 2023 weighted average car-miles per day for all railroads (excluding CSXT) reported to the STB under EP770 (Sub-No 1)

**Exhibit B-46: Summary output for rail transit time pre-merger for merchandise/bulk traffic<sup>196</sup>**

| Rail length of haul (miles) | Average rail transit time pre-merger (hours) |           |
|-----------------------------|----------------------------------------------|-----------|
|                             | Single-line                                  | Interline |
| <b>250-499</b>              | 58                                           | 82        |
| <b>500-749</b>              | 93                                           | 116       |
| <b>750-999</b>              | 129                                          | 154       |
| <b>1000-1499</b>            | 178                                          | 206       |
| <b>1500-1999</b>            | 257                                          | 278       |
| <b>2000+</b>                | 334                                          | 403       |

<sup>194</sup> Ibid.

<sup>195</sup> Includes total load/unload time.

<sup>196</sup> See workpaper “C-Appendix B Exhibits vFinal.xlsx.”

## B.9. Truck Transit Time Assumptions

Truck transit time is calculated as a door-to-door transit time for a given shipment. It was assumed that all truck types travel at an average velocity of 50 miles per hour based on industry experience for a single driver. This velocity assumption includes activities comparable to those included in rail transit velocity (see Section B.4, e.g., handling within the route). Beyond this velocity assumption, truck transit time has been estimated to comply with US Federal Motor Carrier Safety Administration’s (“FMCSA”) hours of service (“HOS”) regulations for property-carrying drivers. The rules and regulations prescribed by the FMCSA were the sole focus, given that the agency is responsible for regulating and enforcing safety standards for commercial motor vehicles (“CMVs”), including large trucks and buses. FMCSA limits on daily driving hours introduce real-world constraints that affect truck transit time calculations:

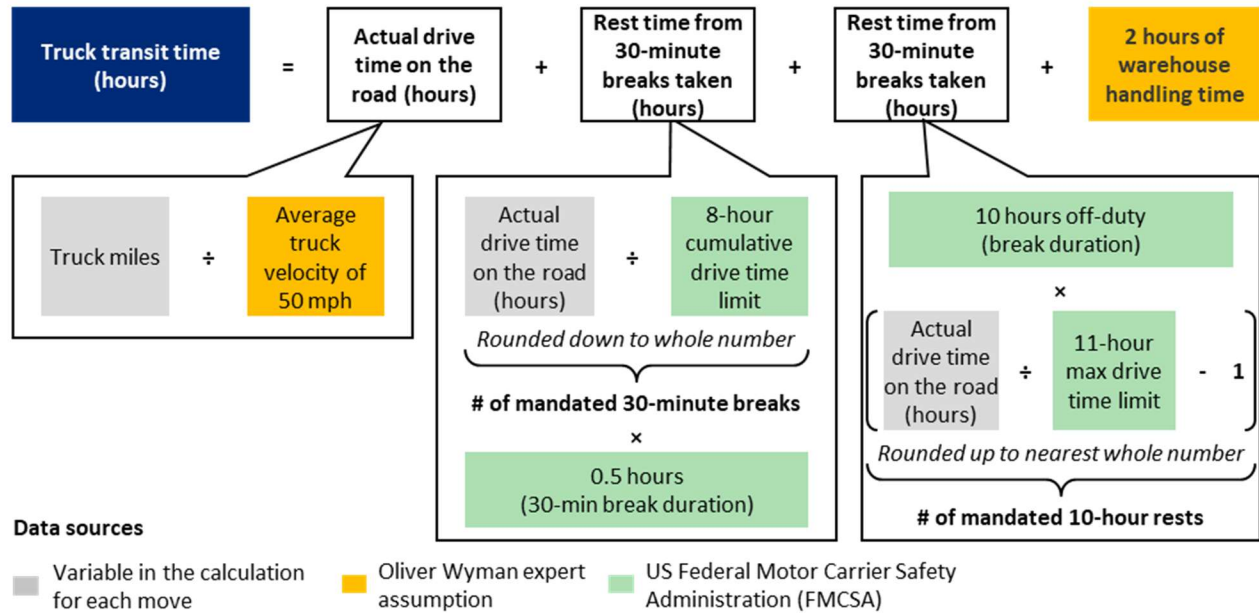
- **11-hour driving limit:** drivers may drive a maximum of 11 hours after 10 consecutive hours off duty.
- **30-minute driving break:** drivers must take a 30-minute break when they have driven for a period of 8 cumulative hours without at least a 30-minute interruption. The break may be satisfied by any non-driving period of 30 consecutive minutes (i.e., on-duty not driving, off-duty, sleeper berth, or any combination of these taken consecutively). It was assumed that drivers will use this 30-minute break efficiently to refuel and will not need to make additional refueling stops at any other time.
- **14-hour limit:** Although there is a rule that drivers may not drive beyond the 14th consecutive hour after coming on duty, a simplifying assumption is made that the driver will maximize the 11-hour driving limit in this 14-hour window and hence duty time will not be a limiting factor for truck transit time.

Similar to how rail transit time accounts for additional origin/destination dwell to reflect reality, a two-hour dwell time was included in all truck transit times to reflect required truck loading and unloading work. Exhibit B-47 summarizes the key expert assumptions made when calculating truck transit time, Exhibit B-48 depicts the entire truck transit time estimation process, and Exhibit B-49 shows summarized outputs of average truck transit time in hours by truck length of haul.

**Exhibit B-47: Summary of Oliver Wyman expert assumptions when calculating truck transit time**

| Metric                                                | Assumed value     | Source                                                                                                            |
|-------------------------------------------------------|-------------------|-------------------------------------------------------------------------------------------------------------------|
| Truck velocity for all truck types                    | 50 miles per hour | Oliver Wyman experience working with large trucking carriers                                                      |
| Total load/unload time                                | 2 hours           |                                                                                                                   |
| Consecutive driving time before required 30-min break | 8 hours           | FMCSA hours of service regulations for property-carrying drivers (Summary of Hours of Service Regulations, FMCSA) |
| Length of break after 8 hours of driving              | 0.5 hours         |                                                                                                                   |
| Consecutive driving time allowed on duty              | 11 hours          |                                                                                                                   |
| Length of rest after 11 consecutive hours of driving  | 10 hours          |                                                                                                                   |

**Exhibit B-48: Process used to estimate truck transit time**



**Exhibit B-49: Summarized output of average truck transit time by length of haul for merchandise/bulk traffic<sup>197</sup>**

| Truck length of haul (miles) | Average truck transit time (hours) |
|------------------------------|------------------------------------|
| 250-499                      | 9                                  |
| 500-749                      | 22                                 |
| 750-999                      | 30                                 |
| 1000-1499                    | 45                                 |
| 1500-1999                    | 64                                 |
| 2000+                        | 91                                 |

## B.10. Assumptions for Transit Time Comparison

Exhibit B-50 summarizes the key assumptions made when calculating merchandise railcar and truck transit times.<sup>198</sup> Applying these assumptions to an example lane between Minneapolis, MN and Columbus, OH, a single-line move can improve transit time by 17% over an interline

<sup>197</sup> See workpaper “C-Appendix B Exhibits vFinal.xlsx.

<sup>198</sup> Truck transit times are regulated by FMCSA HOS regulations (see prior section).

move (Exhibit B-51). While truck is still faster, single-line rail service can narrow the transit time gap and improve rail's competitiveness.<sup>199</sup>

**Exhibit B-50: Summary of assumptions for calculating transit times**

| Metric                                                       | Assumed value     | Source                                                                                                                    |
|--------------------------------------------------------------|-------------------|---------------------------------------------------------------------------------------------------------------------------|
| <b>Merchandise railcar</b>                                   |                   |                                                                                                                           |
| <b>Merchandise car-miles per day</b>                         | 163 miles per day | 2023 weighted average car-miles per day for all railroads (excluding CSXT and TTX car types) reported to the STB (EP 770) |
| <b>Warehouse handling time<sup>200</sup></b>                 | 2 hours           | Oliver Wyman assumption, validated with UP and NS                                                                         |
| <b>Handling time at interchange</b>                          | 22 hours          | 2023 average system terminal dwell time (excluding cars on run-through trains) reported to the STB (49 CFR part 1250)     |
| <b>Truck</b>                                                 |                   |                                                                                                                           |
| <b>Truck velocity for all truck types</b>                    | 50 miles per hour | Oliver Wyman experience working with large trucking carriers                                                              |
| <b>Total load/unload time</b>                                | 2 hours           |                                                                                                                           |
| <b>Consecutive driving time before required 30-min break</b> | 8 hours           | FMCSA HOS regulations for property-carrying drivers (Summary of Hours of Service Regulations, FMCSA)                      |
| <b>Length of break after 8 hours of driving</b>              | 0.5 hours         |                                                                                                                           |
| <b>Consecutive driving time allowed on duty</b>              | 11 hours          |                                                                                                                           |
| <b>Length of rest after 11 consecutive hours of driving</b>  | 10 hours          |                                                                                                                           |

**Exhibit B-51: Illustrative example of impact of railroad interchange on transit time, Minneapolis, MN-Columbus, OH<sup>201</sup>**

|                           | Rail interline | Rail single-line | Truck | Notes                                             |
|---------------------------|----------------|------------------|-------|---------------------------------------------------|
| <b>Mileage</b>            | 720            | 720              | 720   | Use same mileage for this illustrative example    |
| <b>Mph</b>                | 6.8            | 6.8              | 50    | Average speed inclusive of intermediate handlings |
| <b>Hours moving</b>       | 106.0          | 106.0            | 14.4  | Hours while train or truck is in motion           |
| <b>Enroute dwell</b>      | 22             | 0                | 10.5  | Interchange for rail, mandatory rests for truck   |
| <b>Load/unload hours</b>  | 2              | 2                | 2     | Loading/unloading time                            |
| <b>Total hours</b>        | 129.8          | 108.0            | 26.9  | Sum of hours in motion, stationery, at end points |
| <b>Rail hrs/truck hrs</b> | 4.8            | 4.0              |       | Rail hours relative to truck hours                |

<sup>199</sup> (129.8 hours – 108.0 hours) / 129.8 hours = 17%.

<sup>200</sup> Includes total load/unload time.

<sup>201</sup> Example uses the sources listed in Exhibit B-50.

## B.11. Top Diversion Lanes for Truck to Merchandise/Bulk

See Section 4.2.3 for an overview of estimated diversions by origin and destination lanes.

Exhibits B-52 and B-53 below detail estimated carloads and top commodities diverted for the top 10 origin and destination states.

**Exhibit B-52: Top 10 states originating truck-to-rail merchandise diversions<sup>202</sup>**

| Origin state            | Estimated diverted carloads | Top commodities diverted                                                                                                                                                                              |
|-------------------------|-----------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| TX                      | 32,000                      | <ul style="list-style-type: none"> <li>Chemicals or allied products</li> <li>Petroleum or coal products</li> <li>Food and kindred products</li> </ul>                                                 |
| LA                      | 20,000                      |                                                                                                                                                                                                       |
| IA                      | 17,000                      | <ul style="list-style-type: none"> <li>Food and kindred products</li> <li>Chemicals or allied products</li> <li>Nonmetallic ores, minerals, excluding fuels</li> </ul>                                |
| AR                      | 13,000                      | <ul style="list-style-type: none"> <li>Food and kindred products</li> <li>Lumber or wood products, excluding furniture</li> <li>Chemicals or allied products</li> </ul>                               |
| CA                      | 12,000                      | <ul style="list-style-type: none"> <li>Food and kindred products</li> <li>Petroleum or coal products</li> <li>Clay, concrete, glass, or stone products</li> </ul>                                     |
| WI                      | 9,000                       | <ul style="list-style-type: none"> <li>Nonmetallic ores, minerals, excluding fuels</li> <li>Food and kindred products</li> <li>Pulp, paper, or allied products</li> </ul>                             |
| NV                      | 8,000                       | <ul style="list-style-type: none"> <li>Clay, concrete, glass, or stone products</li> <li>Petroleum or coal products</li> <li>Waste or scrap materials not identified by producing industry</li> </ul> |
| IL                      | 8,000                       | <ul style="list-style-type: none"> <li>Food and kindred products</li> <li>Clay, concrete, glass, or stone products</li> <li>Chemicals or allied products</li> </ul>                                   |
| GA                      | 7,000                       | <ul style="list-style-type: none"> <li>Food and kindred products</li> <li>Chemicals or allied products</li> <li>Clay, concrete, glass, or stone products</li> </ul>                                   |
| NE                      | 6,000                       | <ul style="list-style-type: none"> <li>Food and kindred products</li> <li>Nonmetallic ores, minerals, excluding fuels</li> <li>Chemicals or allied products</li> </ul>                                |
| <b>Top 10 total</b>     | <b>132,000</b>              |                                                                                                                                                                                                       |
| <b>Grand total</b>      | <b>191,000</b>              |                                                                                                                                                                                                       |
| <b>% of grand total</b> | <b>69%</b>                  |                                                                                                                                                                                                       |

<sup>202</sup> See workpaper “C-Appendix B Exhibits vFinal.xlsx.”

**Exhibit B-53: Top 10 states terminating truck-to-rail merchandise diversions<sup>203</sup>**

| Destination state       | Estimated diverted carloads | Top commodities diverted                                                                                                                                                      |
|-------------------------|-----------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| OH                      | 20,000                      | <ul style="list-style-type: none"> <li>• Food and kindred products</li> <li>• Chemicals or allied products</li> <li>• Clay, concrete, glass, or stone products</li> </ul>     |
| PA                      | 15,000                      | <ul style="list-style-type: none"> <li>• Food and kindred products</li> <li>• Chemicals or allied products</li> <li>• Petroleum or coal products</li> </ul>                   |
| GA                      | 14,000                      | <ul style="list-style-type: none"> <li>• Food and kindred products</li> <li>• Chemicals or allied products</li> <li>• Lumber or wood products, excluding furniture</li> </ul> |
| TX                      | 12,000                      | <ul style="list-style-type: none"> <li>• Food and kindred products</li> <li>• Chemicals or allied products</li> <li>• Nonmetallic ores, minerals, excluding fuels</li> </ul>  |
| IN                      | 11,000                      | <ul style="list-style-type: none"> <li>• Food and kindred products</li> <li>• Chemicals or allied products</li> <li>• Petroleum or coal products</li> </ul>                   |
| CA                      | 11,000                      | <ul style="list-style-type: none"> <li>• Food and kindred products</li> <li>• Petroleum or coal products</li> <li>• Clay, concrete, glass, or stone products</li> </ul>       |
| NY                      | 11,000                      | <ul style="list-style-type: none"> <li>• Food and kindred products</li> <li>• Petroleum or coal products</li> <li>• Chemicals or allied products</li> </ul>                   |
| NC                      | 9,000                       | <ul style="list-style-type: none"> <li>• Food and kindred products</li> <li>• Chemicals or allied products</li> <li>• Petroleum or coal products</li> </ul>                   |
| MI                      | 9,000                       | <ul style="list-style-type: none"> <li>• Food and kindred products</li> <li>• Clay, concrete, glass, or stone products</li> <li>• Petroleum or coal products</li> </ul>       |
| NJ                      | 9,000                       | <ul style="list-style-type: none"> <li>• Food and kindred products</li> <li>• Petroleum or coal products</li> <li>• Chemicals or allied products</li> </ul>                   |
| <b>Top-10 total</b>     | <b>120,000</b>              |                                                                                                                                                                               |
| <b>Grand total</b>      | <b>191,000</b>              |                                                                                                                                                                               |
| <b>% of grand total</b> | <b>63%</b>                  |                                                                                                                                                                               |

***Commodity-specific truck-to-carload rail merchandise/bulk diversions***

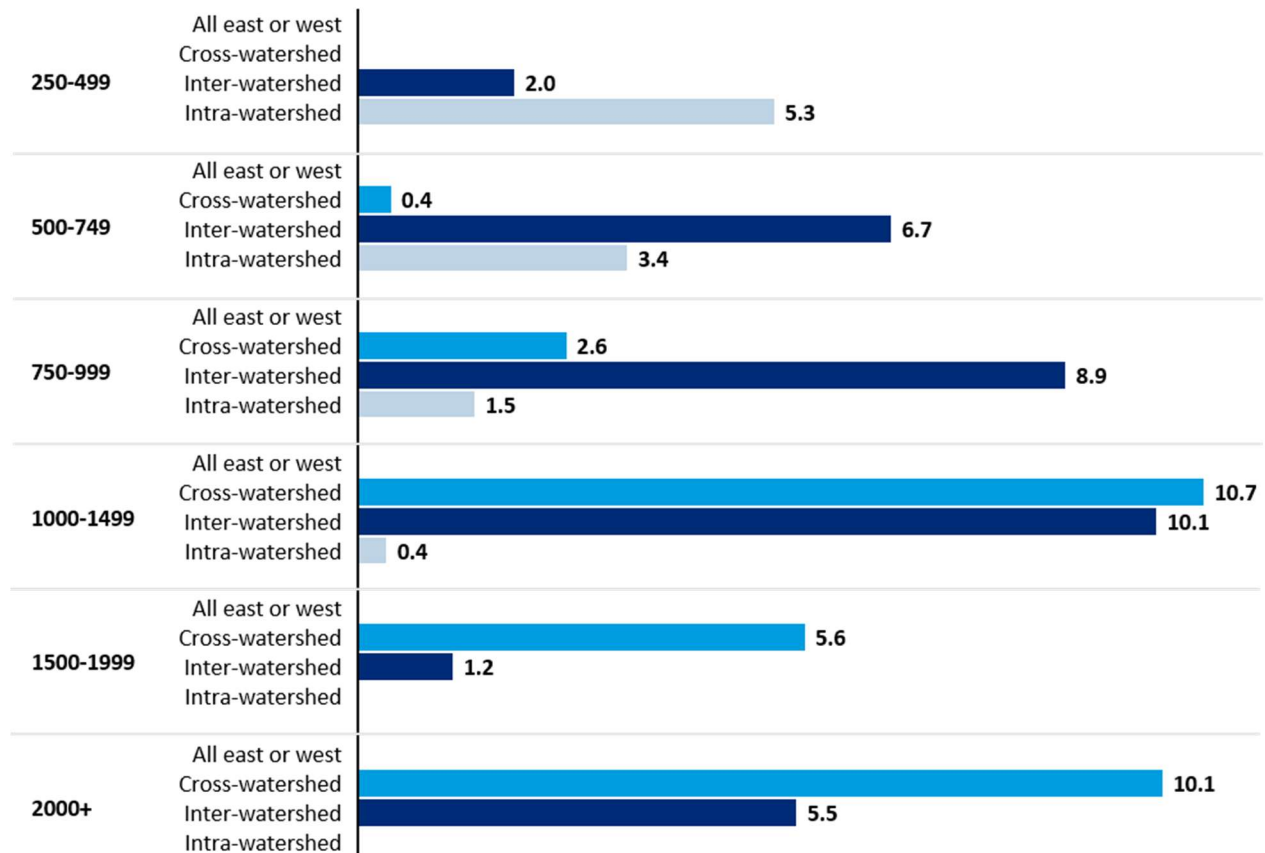
Exhibit B-54 shows the estimated diversions in rail carloads by distance band and by geography relative to the watershed region for food products. There are an estimated 74,400

<sup>203</sup> Ibid.

carloads of diverted food products. Focusing on the 1000-1499 mileage band, most carloads are cross-watershed or inter-watershed diversions. Cross-watershed moves include Iowa to eastern locations, such as Pennsylvania and New Jersey. Inter-watershed moves include lanes like Iowa to Indiana, which is one of the top 10 diverted lanes.

**Exhibit B-54: Estimated truck-to-carload rail diversions of food products, by distance band and watershed region<sup>204</sup>**

Thousands of rail carloads, total = 74,400 carloads



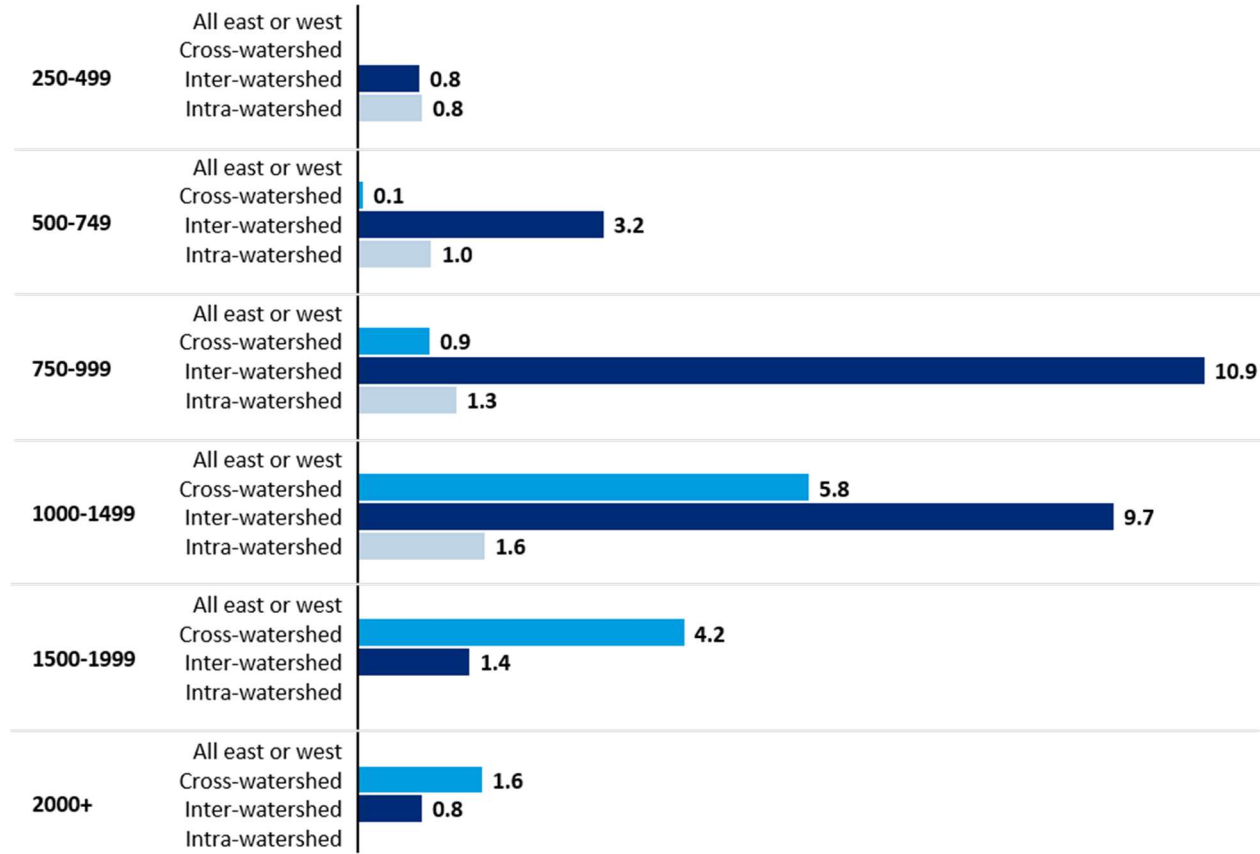
The estimated diversions for chemicals follow a similar pattern as food products, with most diversions occurring in the cross-watershed and inter-watershed regions (Exhibit B-55). Inter-watershed moves include lanes such as Texas to Pennsylvania and Texas to New Jersey. The

<sup>204</sup> Food products = STCC 20. See workpaper “t2merch\_watershed\_summary\_2026\_vFinal.ipynb.”

largest category of chemical diversions is 10,900 carloads in the 750-999 distance band for inter-watershed moves.

**Exhibit B-55: Estimated truck-to-carload rail diversions of chemicals, by distance band and watershed region<sup>205</sup>**

Thousands of rail carloads, total = 44,100 carloads



Primary metals are estimated to be another large source of merchandise/bulk diversions from trucks, totaling 17,000 new rail carloads (Exhibit B-56 below). The top state-state lanes expected to see the majority of this new traffic are Ohio-Texas, California-Ohio, and Alabama-Texas. The top 15 lanes are expected to account for 59% of these diversions.

<sup>205</sup> Ibid. Chemicals = STCC 28.

**Exhibit B-56: Top primary metal state-to-state diversions<sup>206</sup>**

Carloads, total = 17,000

| Lane                         | Diversions    |
|------------------------------|---------------|
| OH-TX                        | 2,000         |
| CA-OH                        | 1,200         |
| AL-TX                        | 1,100         |
| IN-TX                        | 1,000         |
| CA-IL                        | 1,000         |
| IN-MN                        | 500           |
| AL-LA                        | 500           |
| OH-OK                        | 500           |
| CA-IN                        | 400           |
| PA-TX                        | 400           |
| IN-NE                        | 300           |
| AL-IL                        | 300           |
| OH-WA                        | 300           |
| AL-CA                        | 300           |
| NE-OH                        | 300           |
| <b>Top 15 total</b>          | <b>10,100</b> |
| <b>% of total diversions</b> | <b>59%</b>    |

| Origin State                 | Diversions    |
|------------------------------|---------------|
| OH                           | 5,100         |
| IN                           | 3,500         |
| AL                           | 2,600         |
| IL                           | 1,300         |
| PA                           | 800           |
| SC                           | 500           |
| TX                           | 500           |
| MI                           | 400           |
| KY                           | 300           |
| TN                           | 300           |
| VA                           | 300           |
| MS                           | 100           |
| AZ                           | 100           |
| UT                           | 100           |
| WI                           | 100           |
| <b>Top 15 total</b>          | <b>16,000</b> |
| <b>% of total diversions</b> | <b>94%</b>    |

## B.12. Converting Diverted Carloads/Units Into Diverted Truckloads

To estimate the number of trucks diverted off the highway per railcar, the following methodology was followed:

- For intermodal diversions, it was assumed that one container equals one truckload, resulting in the same number of truckloads off the road as estimated truck to rail diverted intermodal units. Each intermodal unit will create two loaded local drayage moves. These were sized based on the average drayage miles for each lane. No empty repositioning miles were assumed for either the reduction in over-the-road trucking or incremental drayage. For over-

<sup>206</sup> Primary metals = STCC 33. Includes rail-to-rail and truck-to-rail diversions. See workpaper “C-Appendix B Exhibits vFinal.xlsx.”

the-road trucking, industry leaders operate 14% empty miles.<sup>207</sup> For drayage, the number is higher, as empty containers must be repositioned to a load or returned to the terminal.

- For finished vehicles, diversions were estimated in carloads, so calculated the tons per average carload carrying finished vehicles (STCC 3711) from the CCWS (20.5 tons/carload).<sup>208</sup> Then, Transearch was used to calculate the average tons/truckload for STCC 3711 (14.1 tons/truckload).<sup>209</sup> No empty repositioning miles were assumed. Empty miles for final mile automotive delivery, and most over-the-road lanes, will be close to 50%, as it is rare for a dealership to also load cars.
- For merchandise/bulk, tons per truck unit by STCC2 commodity and truck equipment type were calculated from Transearch. This ratio was then used to convert estimated diverted tons to truckloads off the highway. No empty repositioning miles were assumed. For dry van and flatbed traffic, empty miles will be similar to general over-the-road trucking. This will increase to 50% for tanker and bulk trucks, as these rarely have backhaul loads.

Exhibit B-57 shows the summary statistics for trucks diverted to rail. This shows that drayage truck-miles and ton-miles created by converting from truck to intermodal are very small compared with the truck traffic that would be removed from highways, excluding empty miles.

A gross ton-mile (“GTM”) estimate for trucks is included, assuming a 15-ton tare weight for a tractor and semi-trailer (all types). This allows for comparison of GTMs removed from the highway with GTMs added to the railroad network. No empty miles for rail are included in the GTM calculation – this is loads versus loads. GTMs are estimated using the shortest path mileage.

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<sup>207</sup> 2023 Knight Swift annual report (14.3% empty miles) and Werner annual report (14.4%) for irregular route, for-hire trucking; see “Knight\_Swift\_2023\_annual\_report\_VF.pdf” and “Werner\_2023\_annual\_report\_VF.pdf.” Note that empty miles percentages shown here are [empty miles] / ([loaded miles] + [empty miles]).

<sup>208</sup> Confidential Carload Waybill Sample, op. cit.; see workpaper “finished\_vehicle\_tons\_per\_carload.sql.”

<sup>209</sup> Transearch, op. cit.; see workpaper “finished\_vehicle\_tons\_per\_truckload.sql.”

Exhibit B-57: Total truckloads and GTMs diverted to rail<sup>210</sup>

| <b>Trucks (thousands)</b>       | <b>Diverted trucks</b>  | <b>Drayage added back</b>   | <b>Net impact</b> |
|---------------------------------|-------------------------|-----------------------------|-------------------|
| Truck to intermodal             | (1,201)                 | 2,402                       | 1,201             |
| Long-haul drayage               | (70)                    | 70                          | -                 |
| <i>Intermodal subtotal</i>      | <i>(1,271)</i>          | <i>2,472</i>                | <i>1,201</i>      |
| Merchandise                     | (850)                   | -                           | (850)             |
| Auto                            | (7)                     | -                           | (7)               |
| <b>Total</b>                    | <b>(2,128)</b>          | <b>2,472</b>                | <b>344</b>        |
| <b>Truck-miles (millions)</b>   | <b>Diverted trucks</b>  | <b>Drayage added back</b>   | <b>Net impact</b> |
| Truck to intermodal             | (2,484)                 | 137                         | (2,348)           |
| Long-haul drayage               | (19)                    | 1                           | (17)              |
| <i>Intermodal subtotal</i>      | <i>(2,503)</i>          | <i>138</i>                  | <i>(2,365)</i>    |
| Merchandise                     | (1,092)                 | -                           | (1,092)           |
| Auto                            | (14)                    | -                           | (14)              |
| <b>Total</b>                    | <b>(3,609)</b>          | <b>138</b>                  | <b>(3,471)</b>    |
| <b>Ton-miles (millions)</b>     | <b>Diverted trucks</b>  | <b>Drayage added back</b>   | <b>Net impact</b> |
| Truck to intermodal             | (35,478)                | 1,953                       | (33,524)          |
| Long-haul drayage               | (266)                   | 19                          | (247)             |
| <i>Intermodal subtotal</i>      | <i>(35,743)</i>         | <i>1,972</i>                | <i>(33,771)</i>   |
| Merchandise                     | (23,541)                | -                           | (23,541)          |
| Auto                            | (233)                   | -                           | (233)             |
| <b>Total</b>                    | <b>(59,517)</b>         | <b>1,972</b>                | <b>(57,545)</b>   |
| <b>Avg miles per unit</b>       | <b>Diverted trucks</b>  | <b>Drayage added back</b>   | <b>Net impact</b> |
| Truck to intermodal             | 2,069                   | 57                          | 2,012             |
| Long-haul drayage               | 265                     | 19                          | 246               |
| <i>Intermodal subtotal</i>      | <i>1,969</i>            | <i>56</i>                   | <i>1,913</i>      |
| Merchandise                     | 1,286                   | -                           | 1,286             |
| Auto                            | 1,890                   | -                           | 1,890             |
| <b>Total</b>                    | <b>1,696</b>            | <b>56</b>                   | <b>1,640</b>      |
| <b>Avg. laden tons per unit</b> | <b>Diverted trucks</b>  | <b>Drayage added back</b>   | <b>Net impact</b> |
| Truck to intermodal             | 14.3                    | 14.3                        | 14.3              |
| Long-haul drayage               | 14.3                    | 14.3                        | 14.3              |
| <i>Intermodal subtotal</i>      | <i>14.3</i>             | <i>14.3</i>                 | <i>14.3</i>       |
| Merchandise                     | 21.6                    | -                           | 21.6              |
| Auto                            | 17.1                    | -                           | 17.1              |
| <b>Total</b>                    | <b>16.5</b>             | <b>14.3</b>                 | <b>16.6</b>       |
| <b>GTMs (millions)</b>          | <b>Diverted trucks</b>  | <b>Drayage added back</b>   | <b>Truck GTMs</b> |
| Truck to intermodal             | (72,744)                | 4,005                       | (68,739)          |
| Long-haul drayage               | (545)                   | 39                          | (506)             |
| <i>Intermodal subtotal</i>      | <i>(73,289)</i>         | <i>4,044</i>                | <i>(69,245)</i>   |
| Merchandise                     | (39,926)                | -                           | (39,926)          |
| Auto                            | (438)                   | -                           | (438)             |
| <b>Total</b>                    | <b>(113,653)</b>        | <b>4,044</b>                | <b>(109,609)</b>  |
| <b>Rail GTMs (millions)</b>     | <b>Diverted freight</b> | <b>Extended haul offset</b> | <b>Rail GTMs</b>  |
| Truck to intermodal             | 89,210                  | -                           | 89,210            |
| Long-haul drayage               | 4,612                   | (4,066)                     | 546               |
| <i>Intermodal subtotal</i>      | <i>93,822</i>           | <i>(4,066)</i>              | <i>89,755</i>     |

<sup>210</sup> See workpaper “C-Trucks Diverted from Highway vFinal.xlsx.”

REDACTED VERSION – TO BE PLACED ON PUBLIC RECORD

|                            |                  |                |                |
|----------------------------|------------------|----------------|----------------|
| Merchandise                | 36,040           | -              | 36,040         |
| Auto                       | 794              | -              | 794            |
| <b>Total</b>               | <b>130,656</b>   | <b>(4,066)</b> | <b>126,590</b> |
| <b>Difference</b>          | <b>Truck</b>     | <b>Rail</b>    | <b>Net</b>     |
| Truck to intermodal        | (68,739)         | 89,210         | 20,471         |
| Long-haul drayage          | (506)            | 546            | 40             |
| <i>Intermodal subtotal</i> | (69,245)         | 89,755         | 20,510         |
| Merchandise                | (39,926)         | 36,040         | (3,886)        |
| Auto                       | (438)            | 794            | 357            |
| <b>Total</b>               | <b>(109,609)</b> | <b>126,590</b> | <b>16,981</b>  |

## Appendix C. Diversion Model Application

### C.1. Transition to Operating Plan

The processing of the diversion traffic to the operating plan was divided into three layers:

- **Rail-to-rail diversions.** This process consolidated small flows and ensured the number of diversions remained the same by identifying other diversion flows which were grossed up to reflect the traffic removed.
- **Truck-to-rail diversions.** Most of the diversions were small, so many of them needed to be consolidated for the Operating Plan, while ensuring that the Operating Plan would have valid volumes for blocks, trains, and yards.
- **Intermodal diversions.** The intermodal diversion traffic had been already screened to ensure there would be sufficient density to offer service and matched to origin-destination terminals. Terminal remaps and offsets are calculated within the intermodal diversion model.<sup>211</sup> The rail-to-rail extended haul (i.e. UP or NS is already party to the traffic) and longhaul drayage extended haul diversions, required offsets to ensure the existing traffic is not double counted. Intermodal offsets for rail-to-rail extended hauls are calculated using the modelled rail route and gateway. Traffic between the origin market and gateway market is identified and reduced by the amount equal to the rail-to-rail diversion. The exact terminal-to-terminal lanes are selected based on the largest traffic flows by volume in the Optimized Plan. There is a negligible gross-up on a unit count basis to concentrate the offsets for feasibility of modelling. Longhaul drayage offsets are also offset on a 1:1 basis with existing traffic to/from Chicago, IL and Memphis, TN based on the lanes that will be available in the Growth Plan to Detroit, MI / Toledo, OH and Huntsville, AL respectively. No further

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<sup>211</sup> See workpaper “HC-Intermodal Diversions Model vFinal.xlsx.”

adjustments were performed. The Operating Plan details the creation of systemwide empty container flows to balance each terminal catchment area.

### **C.1.0. Rail-to-Rail Diversions to the Operating Plan**

After estimating merchandise/bulk and automotive rail-to-rail diversions, selected adjustments were applied to prepare and compress data before inputting into MultiRail.<sup>212</sup> These adjustments are reflected in the total diversions reported earlier in this statement.

- Removed diversions that experts from NS and UP thought were unlikely due to either physical network connectivity issues (such as the ability to reach the assembly location), existing long-term contracts with other railroads, or rail-on-waterway lanes. This impacted certain loaded auto (multilevel) moves detailed in Section A.7.3 above, and diversions from the CGR train ferry between Alabama and Mexico.
- Mapped all diverted traffic to MultiRail nodes:
  - Restricted diversions to the ~3,300 nodes capable of originating or terminating blocks.
  - Reassigned diversions to block-handling nodes within a 50 mile radius as needed.

Diversion locations had SPLCs that needed to be translated into valid blocking locations.

  - For automotive diversions, mapped traffic to nodes with auto ramps. Input from experts at UP-NS informed which locations are capable of handling additional automotive traffic.
- Rationalized the “long tail” of lanes with fractional annual diverted cars and grossed up diversions accordingly to preserve total car-miles. For example, the bulk diversions decreased by 2% when the “long tail” was removed, and the bulk car counts for each lane were increased by 102% ( $98\% \times 102\% = 100\%$ ) to compensate. Auto traffic had no gross-up

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<sup>212</sup> See workpapers “R2R\_Diversions\_2\_MR\_AUTO\_ONLY.ipynb” and “R2R\_Diversions\_2\_MR\_MERCH\_BULK.ipynb.”

- less than 0.5% of the traffic was rationalized to align the loaded diversions with the empty multi-level logic.
- Examined the path of each diversion and compared it to the original path to see if the diversion was an extended haul, new diversion, or existing lane.
  - New diversion: If the original traffic flow was from AAA to BBB on BNSF and BBB to CCC on CSXT, and the diversion was AAA to CCC on the combined UP/NS railroad, this would be considered a new diversion.
  - Extended haul: If the original traffic flow was AAA to BBB on UP, and then BBB to CCC on CSXT, and the diversion was AAA to CCC on UP/NS, this was considered an extended haul. That is, the original UP/NS flow was from AAA to BBB and then extended to CCC.
  - Existing lane: If the original traffic flow was AAA to BBB on UP, and then BBB to CCC on NS, and the diversion estimated that more traffic will be attracted to route, then the diversion is onto an existing UP-NS lane.
- In the output of this process, the origin/destination and railroad (UP or NS) of extended hauls was recorded. How this is used is discussed in the next section on offsets.
- Modeled the movement of empty cars generated by the diverted traffic:
  - For merchandise and bulk, added empties on a one-to-one basis for rail-to-rail diversions.
  - For automotive, empties were modeled based on the combined rail-to-rail and truck-to-rail diversions, plus auto traffic from the 2023 base traffic. This was done to represent the more efficient industry-wide movement of empty multilevels.

- Obtained representative net- weight, tare, and length for the cars in a diversion lane. This was based on examining the traffic data in MultiRail (which was sourced from waybills) to obtain appropriate average weights and lengths.

### **C.1.1. Rail-to-Rail Offsets to the Operating Plan**

As described above, the rail-to-rail diversions were classified either as new, extended, or existing. For extended haul, it was important to back out the original traffic. For example, if the original traffic was AAA to BBB on UP and BBB to CCC on CSXT, and the diversion was 10 cars moving AAA to CCC on UP/NS, then that traffic record was added to the Operating Plan, but existing traffic records in the Operating Plan that went from AAA to BBB had to be identified and a total of 10 cars subtracted from them. A gross-up was applied in a small number of cases to ensure that any lanes where there was no traffic to offset in the compressed traffic file, to keep the total car-miles of the offsets the same.

That identification was routine in most cases. For example, suppose there are five traffic records from AAA to BBB with slightly different characteristics (such as the from/to railroad) with a total of 40 cars. Traffic was reduced by 25% for each of those five traffic records.

In some cases, an exact match was not found. This was due to one of three reasons:

- The identification of the interchange location was made by examining the Quantanet path. Sometimes the Quantanet interchange location differed from the actual interchange. For example, the Chicago interchange being deduced as the interchange when it actually occurred in St. Louis. A table of override interchange locations was developed to better match identification of offset lanes.

- In a few cases, the service type indicated the traffic was merchandise, but the traffic would actually be in bulk and the existing traffic in the offset was found in the bulk traffic. In that case, the diversion was changed from merchandise to bulk and used the bulk traffic offset.
- Due mostly to remapping waybill locations to MultiRail nodes, there were times when an exact lane matching the extended lane could not be found. A common situation was in Chicago, with many nodes and the same SPLC. The exact lane that matched the diversion route could not always be found, so the MultiRail lane that was closest to it was used instead (i.e., the two end points of the diversion extended haul lane were close to the two end points of the MultiRail lane).

### **C.1.2. Truck-to-Rail Diversions to the Operating Plan**

The truck-to-rail conversion to the MultiRail operating plan had the following steps:<sup>213</sup>

- Translated the FIPS codes that were used as origins and destinations of the diversions into the ~3,300 blocking locations in MultiRail.
- Reduced the traffic to a manageable set for inclusion into the operating plan.

Traffic reduction needed a different approach than what was used for rail-to-rail diversions, where a cutoff of 10 cars per year was used. In that case, a significant number of the lanes were kept, and the gross-up factors are small. This approach was sufficient to ensure that the trains and the blocks in the operating plan would have reasonable volumes.

For truck-to-rail, a simple cutoff of, for example, 10 cars per year would result in using only 1.3% of traffic lanes. The concern was that a simple gross-up based on car counts might not reflect the varying distances of the diversion lanes, which would lead to inaccurate block and train volume estimates with the Operating Plan.

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<sup>213</sup> See workpaper “T2R\_Diversions\_2\_MR.ipynb.”

A different approach for grossing up was used –car-miles were maintained by STCC and car-type instead of car counts. Using car-miles better reflects the increases found in the diversion model and gave reasonable block and train volumes (which aggregate traffic to various levels). However, using car-miles does result in the number of cars changing.

As a result of this compression, diverted carloads increased from 191,354 to 191,721 for truck-to-rail merchandise. Total diverted car-miles remained unchanged for all diversion types. Diverted finished vehicles were only in 36 lanes and there was no need to change that.

## C.2. Revenue Calculation

The revenue impact from the diversion analysis output was estimated after diversion estimates had been delivered to the Operating Plan, to create a more realistic revenue estimate. The model estimates were compressed to flow over in the Operating Plan (see C.1 “Transition to Operating Plan”), and offsets from extended haul traffic were made during this step.<sup>214</sup> During the traffic compression process, specific merchandise rail-to-rail diversions were reclassified as bulk rail-to-rail diversions because those commodities, in those corridors, currently move in unit trains. This is reflected in the revenue calculations, as bulk pricing is different from carload. This affects approximately 12,000 merchandise rail-to-rail diversions.

To estimate the UP-NS revenue increase from rail-to-rail and truck-to-rail diversions, the following formula was used:

$$\text{Revenue} = \text{Diverted Net Tons} \times \text{Miles on UPNS network} \times \text{Revenue per Ton-Mile} - \text{Offset Revenue}$$

For all traffic, revenue per ton-mile was calculated from the 2023 CCWS by plotting the data in Microsoft Excel and fitting a trendline, where a regression based on a power curve provided the best fit for the trendline (see Appendix B.6 for an explanation of the regression

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<sup>214</sup> See STB Finance Docket No. 36873, Operating Plan Verified Statement, op. cit.

curve and the results). Three regressions were applied to estimate revenue per-ton-mile.<sup>215</sup>

Merchandise and bulk traffic utilized a lookup table based on the regression analysis, adjusting for STCC2 commodity, junction frequency, and length of haul based on CCWS service types 1 (general merchandise) and 3 (bulk) traffic. Intermodal traffic utilized a lookup table based on the regression analysis of CCWS service type 2 (intermodal) traffic, adjusting for junction frequency and length of haul only, without an adjustment for the commodities of the goods traveling by container. Automotive traffic utilized a lookup table based on the regression analysis of CCWS finished vehicle (STCC 3711) traffic, adjusting for junction frequency and length of haul only.

For miles traveled on the UP-NS network, a shortest path distance was used, as calculated in the Operating Plan, defined as the shortest distance between two points on the MultiRail network. The shortest path distance, as opposed to the block distance, was selected for congruity with the revenue per ton-mile figures derived from the CCWS, which also is based on a shortest path calculation performed by the Board.

A revenue offset was created to subtract revenue that was previously assigned to a routing when the same traffic was switched to a different route after the merger. This prevented double counting revenue. As an illustrative example, when Los Angeles-Chicago-Harrisburg traffic was moved from BNSF-NS to UP-NS, the revenue currently recorded on the BNSF-NS routing (the offset) was removed before assigning the revenue to the UP-NS routing (see Exhibit C-1). All offsets are from current interline routes, except for long-haul drayage intermodal diversions to extended haul which, with a small number of exceptions, are extensions of existing UP single-line lanes to/from Chicago, IL and Memphis, TN.

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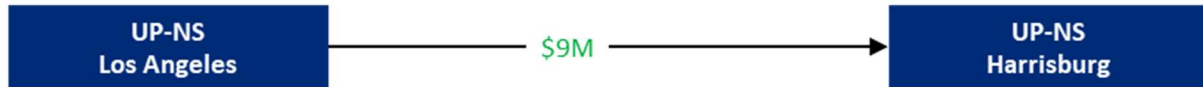
<sup>215</sup> See workpaper “RevenuePerTM\_Distance\_JF.xlsx” for all revenue per ton-mile calculations.

**Exhibit C-1: Revenue offset procedure (illustrative)**

Pre-merger traffic: **BNSF-NS**



Post-merger traffic: **UP-NS**



**Offset removal steps:**

1. Identify diverted traffic revenue to add (+\$9M)
2. Subtract revenue from portion of original routing to avoid counting twice (-\$4M)
3. Diversion traffic net revenue is the incremental growth for UPNS (\$5M)

Several merchandise diversions had offsets that were only found in the historical UP or NS bulk traffic data. This is due to the Board classifying certain traffic (e.g., frack sand, ethanol) as merchandise, while the railroads consider this to be bulk traffic in their operating plans, as it is operated in unit trains. Specific diversions were reclassified to UP-NS as bulk traffic to match up with corresponding offsets in bulk traffic.

## Appendix D. Geographic Definitions

### D.1. Intermodal BEAs With Adjustments

The intermodal catchment areas were defined based on where intermodal traffic terminates and originates in the CCWS. Each of these locations was grouped based on BEA or in some specific cases into a new intermodal catchment area. Each catchment area had a primary county (FIPS\_gp – Exhibit D-1) which contained the most intermodal lifts (originations + terminating trailer container units. The counties identified in FIPS\_gp represent terminals and were used in the truck to intermodal analysis for calculating the intermodal lane catchment areas. Similarly, for the rail-to-rail intermodal analysis, this list of groups was used to define the competitive set of FIPS and hence terminals in the CCWS.

There are BEAs that are sufficiently large as to represent multiple non-overlapping intermodal markets. These were broken apart as such and highlighted in the table below:

- BEA 10 – New York-No. New Jersey-Long Island, NY-NJ-CT-PA (CMSA-70) was split into “New Jersey” (Croton- NS, ERail-NS, North Kearney-CSXT, North Bergen-CSXT terminals), Lehigh Valley (Bethlehem-NS, Taylor-NS), and two terminals moved into the Boston/New England market (Hartford-CSXT and Springfield-CSXT).
- BEA 134 – San Antonio, TX was split into San Antonio (SAIT) and Laredo, TX (Port Laredo-UP and Laredo-CPKC).

One group of BEAs was partially combined to more accurately capture the market dynamics of Detroit, MI and that the Detroit market is served from nearby terminals in Ohio (Toledo, OH and North Baltimore, OH). These terminal FIPS are grouped together into “Detroit and Toledo” in Exhibit D-1 to reflect how the market views these as competitive choices to serve the freight.

**Exhibit D-1: BEA + additional intermodal terminal catchment areas<sup>216</sup>**

| <b>BEA + additional intermodal terminal catchments</b>       | <b>FIPS</b> | <b>FIPS_gp</b> | <b>BEA</b> |
|--------------------------------------------------------------|-------------|----------------|------------|
| Bangor, ME.                                                  | 23011       | 23011          | 001        |
| Boston-Worcester-Lawrence-Lowell-Brockton, MA-NH.            | 25027       | 25027          | 003        |
| Boston-Worcester-Lawrence-Lowell-Brockton, MA-NH.            | 25017       | 25027          | 003        |
| Boston-Worcester-Lawrence-Lowell-Brockton, MA-NH.            | 25025       | 25027          | 003        |
| Boston-Worcester-Lawrence-Lowell-Brockton, MA-NH.            | 33011       | 25027          | 003        |
| Albany-Schenectady-Troy, NY.                                 | 36001       | 36001          | 005        |
| Albany-Schenectady-Troy, NY.                                 | 36091       | 36001          | 005        |
| Syracuse, NY.                                                | 36067       | 36067          | 006        |
| Syracuse, NY.                                                | 36045       | 36067          | 006        |
| Rochester, NY.                                               | 36055       | 36055          | 007        |
| Buffalo-Niagara Falls, NY.                                   | 36029       | 36029          | 008        |
| Buffalo-Niagara Falls, NY.                                   | 36063       | 36029          | 008        |
| Boston-Worcester-Lawrence-Lowell-Brockton, MA-NH.            | 09001       | 25027          | 010        |
| Boston-Worcester-Lawrence-Lowell-Brockton, MA-NH.            | 25013       | 25027          | 010        |
| New Jersey                                                   | 34017       | 34017          | 010        |
| New Jersey                                                   | 34039       | 34017          | 010        |
| New Jersey                                                   | 34013       | 34017          | 010        |
| New Jersey                                                   | 36085       | 34017          | 010        |
| Lehigh Valley                                                | 42095       | 42095          | 010        |
| Lehigh Valley                                                | 42069       | 42095          | 010        |
| Lehigh Valley                                                | 42025       | 42095          | 010        |
| Harrisburg-Lebanon-Carlisle, PA.                             | 42043       | 42043          | 011        |
| Harrisburg-Lebanon-Carlisle, PA.                             | 42041       | 42043          | 011        |
| Philadelphia-Wilmington-Atlantic City, PA-NJ-DE-MD (CMSA-77) | 34015       | 42017          | 012        |
| Philadelphia-Wilmington-Atlantic City, PA-NJ-DE-MD (CMSA-77) | 42017       | 42017          | 012        |
| Philadelphia-Wilmington-Atlantic City, PA-NJ-DE-MD (CMSA-77) | 42101       | 42017          | 012        |
| Washington-Baltimore, DC-MD-VA-WV (CMSA-97)                  | 24510       | 24510          | 013        |
| Harrisburg-Lebanon-Carlisle, PA.                             | 42055       | 42043          | 013        |
| Washington-Baltimore, DC-MD-VA-WV (CMSA-97)                  | 51187       | 24510          | 013        |
| Staunton, VA.                                                | 51660       | 51660          | 016        |
| Greensboro-Winston-Salem-High Point, NC.                     | 37081       | 37081          | 018        |
| Raleigh-Durham-Chapel Hill, NC.                              | 37065       | 37065          | 019        |
| Norfolk-Virginia Beach-Newport News, VA-NC.                  | 51710       | 51710          | 020        |
| Norfolk-Virginia Beach-Newport News, VA-NC.                  | 51740       | 51710          | 020        |
| Charlotte-Gastonia-Rock Hill, NC-SC.                         | 37119       | 37119          | 023        |

<sup>216</sup> Based on Oliver Wyman expert intermodal market knowledge.

REDACTED VERSION – TO BE PLACED ON PUBLIC RECORD

| BEA + additional intermodal terminal catchments | FIPS  | FIPS_gp | BEA |
|-------------------------------------------------|-------|---------|-----|
| Wilmington, NC.                                 | 37129 | 45033   | 025 |
| Wilmington, NC.                                 | 37019 | 45033   | 025 |
| Wilmington, NC.                                 | 45033 | 45033   | 025 |
| Charleston-North Charleston, SC.                | 45019 | 45019   | 026 |
| Charleston-North Charleston, SC.                | 45015 | 45019   | 026 |
| Augusta-Aiken, GA-SC.                           | 45011 | 45011   | 027 |
| Savannah, GA.                                   | 13051 | 13051   | 028 |
| Jacksonville, FL.                               | 12031 | 12031   | 029 |
| Jacksonville, FL.                               | 13039 | 12031   | 029 |
| Central Florida                                 | 12105 | 12105   | 030 |
| Central Florida                                 | 12009 | 12105   | 030 |
| Miami-Fort Lauderdale, FL (CMSA-56).            | 12086 | 12086   | 031 |
| Miami-Fort Lauderdale, FL (CMSA-56).            | 12011 | 12086   | 031 |
| Miami-Fort Lauderdale, FL (CMSA-56).            | 12099 | 12086   | 031 |
| Miami-Fort Lauderdale, FL (CMSA-56).            | 12111 | 12086   | 031 |
| Central Florida                                 | 12057 | 12105   | 034 |
| Atlanta, GA.                                    | 13067 | 13121   | 040 |
| Atlanta, GA.                                    | 13121 | 13121   | 040 |
| Atlanta, GA.                                    | 13213 | 13121   | 040 |
| Greenville-Spartanburg-Anderson, SC.            | 45045 | 45045   | 041 |
| Greenville-Spartanburg-Anderson, SC.            | 45021 | 45045   | 041 |
| Knoxville, TN.                                  | 47145 | 47145   | 044 |
| Lexington, KY.                                  | 21209 | 21209   | 047 |
| Lexington, KY.                                  | 21151 | 21209   | 047 |
| Cincinnati-Hamilton, OH-KY-IN (CMSA-21).        | 39061 | 39061   | 049 |
| Columbus, OH.                                   | 39049 | 39049   | 051 |
| Columbus, OH.                                   | 39129 | 39049   | 051 |
| Columbus, OH.                                   | 39131 | 39049   | 051 |
| Pittsburgh, PA.                                 | 42003 | 42003   | 053 |
| Pittsburgh, PA.                                 | 42129 | 42003   | 053 |
| Cleveland-Akron, OH (CMSA-28).                  | 39035 | 39035   | 055 |
| Cleveland-Akron, OH (CMSA-28).                  | 39029 | 39035   | 055 |
| Detroit and Toledo                              | 39173 | 26163   | 056 |
| Detroit and Toledo                              | 39095 | 26163   | 056 |
| Detroit and Toledo                              | 26163 | 26163   | 057 |
| Detroit and Toledo                              | 26125 | 26163   | 057 |
| Detroit and Toledo                              | 26161 | 26163   | 057 |

REDACTED VERSION – TO BE PLACED ON PUBLIC RECORD

| BEA + additional intermodal terminal catchments | FIPS  | FIPS_gp | BEA |
|-------------------------------------------------|-------|---------|-----|
| Detroit and Toledo                              | 26147 | 26163   | 057 |
| Green Bay, WI.                                  | 26109 | 26109   | 059 |
| Milwaukee-Racine, WI (CMSA-63).                 | 55079 | 55079   | 063 |
| Chicago-Gary-Kenosha, IL-IN-WI (CMSA-14).       | 17031 | 17031   | 064 |
| Chicago-Gary-Kenosha, IL-IN-WI (CMSA-14).       | 17197 | 17031   | 064 |
| Indianapolis, IN.                               | 18097 | 18097   | 067 |
| Indianapolis, IN.                               | 18023 | 18097   | 067 |
| Indianapolis, IN.                               | 18133 | 18097   | 067 |
| Champaign-Urbana, IL.                           | 17115 | 17115   | 068 |
| Evansville-Henderson, IN-KY.                    | 18101 | 18101   | 069 |
| Louisville, KY-IN.                              | 21111 | 21111   | 070 |
| Nashville, TN.                                  | 21047 | 47037   | 071 |
| Nashville, TN.                                  | 47037 | 47037   | 071 |
| Memphis, TN-AR-MS.                              | 05035 | 47157   | 073 |
| Memphis, TN-AR-MS.                              | 47157 | 47157   | 073 |
| Memphis, TN-AR-MS.                              | 47047 | 47157   | 073 |
| Huntsville, AL.                                 | 01089 | 01089   | 074 |
| Jackson, MS.                                    | 01063 | 28049   | 077 |
| Jackson, MS.                                    | 28075 | 28049   | 077 |
| Jackson, MS.                                    | 28049 | 28049   | 077 |
| Jackson, MS.                                    | 28035 | 28049   | 077 |
| Birmingham, AL.                                 | 01073 | 01073   | 078 |
| Birmingham, AL.                                 | 01015 | 01073   | 078 |
| Mobile, AL.                                     | 01097 | 01097   | 080 |
| New Orleans, LA.                                | 22071 | 22071   | 083 |
| New Orleans, LA.                                | 22051 | 22071   | 083 |
| Baton Rouge, LA.                                | 22047 | 22047   | 084 |
| Lake Charles, LA.                               | 22115 | 22115   | 086 |
| Beaumont-Port Arthur, TX.                       | 48245 | 48245   | 087 |
| Shreveport-Bossier City, LA.                    | 22017 | 22017   | 088 |
| Monroe, LA.                                     | 22073 | 22073   | 089 |
| Little Rock-North Little Rock, AR.              | 05019 | 05019   | 090 |
| St. Louis, MO-IL.                               | 17163 | 17163   | 096 |
| St. Louis, MO-IL.                               | 17121 | 17163   | 096 |
| St. Louis, MO-IL.                               | 29510 | 17163   | 096 |
| Kansas City, MO-KS.                             | 20091 | 29095   | 099 |
| Kansas City, MO-KS.                             | 20045 | 29095   | 099 |

REDACTED VERSION – TO BE PLACED ON PUBLIC RECORD

| <b>BEA + additional intermodal terminal catchments</b> | <b>FIPS</b> | <b>FIPS_gp</b> | <b>BEA</b> |
|--------------------------------------------------------|-------------|----------------|------------|
| Kansas City, MO-KS.                                    | 29095       | 29095          | 099        |
| Des Moines, IA.                                        | 19023       | 19023          | 100        |
| La Crosse, WI-MN.                                      | 55121       | 55121          | 105        |
| Minneapolis-St. Paul, MN-WI.                           | 27123       | 27123          | 107        |
| Minneapolis-St. Paul, MN-WI.                           | 27053       | 27123          | 107        |
| Minneapolis-St. Paul, MN-WI.                           | 55017       | 27123          | 107        |
| Minneapolis-St. Paul, MN-WI.                           | 55109       | 27123          | 107        |
| Duluth-Superior, MN-WI.                                | 27137       | 27137          | 109        |
| Duluth-Superior, MN-WI.                                | 27071       | 27137          | 109        |
| Minot, ND.                                             | 38101       | 38101          | 111        |
| Omaha, NE-IA.                                          | 19155       | 19155          | 118        |
| Omaha, NE-IA.                                          | 31053       | 19155          | 118        |
| Omaha, NE-IA.                                          | 31055       | 19155          | 118        |
| Topeka, KS.                                            | 20061       | 20061          | 123        |
| Tulsa, OK.                                             | 40121       | 40121          | 124        |
| Western Oklahoma, OK.                                  | 40065       | 40065          | 126        |
| Dallas-Fort Worth, TX (CMSA-31).                       | 48439       | 48439          | 127        |
| Dallas-Fort Worth, TX (CMSA-31).                       | 48113       | 48439          | 127        |
| Dallas-Fort Worth, TX (CMSA-31).                       | 48085       | 48439          | 127        |
| Houston-Galveston-Brazoria, TX (CMSA-42).              | 48201       | 48201          | 131        |
| Houston-Galveston-Brazoria, TX (CMSA-42).              | 48157       | 48201          | 131        |
| Corpus Christi, TX.                                    | 48355       | 48355          | 132        |
| McAllen-Edinburg-Mission, TX.                          | 48215       | 48215          | 133        |
| McAllen-Edinburg-Mission, TX.                          | 48061       | 48215          | 133        |
| Laredo                                                 | 48479       | 48479          | 134        |
| San Antonio, TX.                                       | 48029       | 48029          | 134        |
| Eagle Pass                                             | 48323       | 48323          | 134        |
| Odessa-Midland, TX.                                    | 48475       | 48475          | 135        |
| Lubbock, TX.                                           | 48303       | 48303          | 137        |
| Amarillo, TX.                                          | 48381       | 48381          | 138        |
| Denver-Boulder-Greeley, CO (CMSA-34).                  | 08031       | 08031          | 141        |
| Denver-Boulder-Greeley, CO (CMSA-34).                  | 08041       | 08031          | 141        |
| Denver-Boulder-Greeley, CO (CMSA-34).                  | 08075       | 08031          | 141        |
| Caster, WY.                                            | 16029       | 49009          | 143        |
| Caster, WY.                                            | 49009       | 49009          | 143        |
| Missoula, MT.                                          | 30093       | 30093          | 146        |
| Spokane, WA.                                           | 16055       | 53063          | 147        |

| BEA + additional intermodal terminal catchments   | FIPS  | FIPS_gp | BEA |
|---------------------------------------------------|-------|---------|-----|
| Spokane, WA.                                      | 53063 | 53063   | 147 |
| Idaho Falls, ID.                                  | 16005 | 16005   | 148 |
| Idaho Falls, ID.                                  | 16077 | 16005   | 148 |
| Reno, NV.                                         | 32031 | 32031   | 151 |
| Reno, NV.                                         | 32007 | 32031   | 151 |
| Reno, NV.                                         | 32013 | 32031   | 151 |
| Salt Lake City-Ogden, UT.                         | 49035 | 49035   | 152 |
| Salt Lake City-Ogden, UT.                         | 49045 | 49035   | 152 |
| Las Vegas, NV-AZ.                                 | 32003 | 32003   | 153 |
| Albuquerque, NM.                                  | 35001 | 35001   | 156 |
| El Paso, TX.                                      | 35013 | 35013   | 157 |
| El Paso, TX.                                      | 48141 | 35013   | 157 |
| Phoenix-Mesa, AZ.                                 | 04013 | 04013   | 158 |
| Tucson, AZ.                                       | 04019 | 04019   | 159 |
| Tucson, AZ.                                       | 04023 | 04019   | 159 |
| Los Angeles-Riverside-Orange County, CA (CMSA-49) | 04012 | 06037   | 160 |
| Los Angeles-Riverside-Orange County, CA (CMSA-49) | 06037 | 06037   | 160 |
| Los Angeles-Riverside-Orange County, CA (CMSA-49) | 06071 | 06037   | 160 |
| Los Angeles-Riverside-Orange County, CA (CMSA-49) | 06025 | 06037   | 160 |
| Fresno, CA.                                       | 06019 | 06019   | 162 |
| San Francisco-Oakland-San Jose, CA (CMSA-84).     | 06077 | 06077   | 163 |
| San Francisco-Oakland-San Jose, CA (CMSA-84).     | 06001 | 06077   | 163 |
| San Francisco-Oakland-San Jose, CA (CMSA-84).     | 06013 | 06077   | 163 |
| Portland-Salem, OR-WA (CMSA-79).                  | 41051 | 41051   | 167 |
| Portland-Salem, OR-WA (CMSA-79).                  | 53039 | 41051   | 167 |
| Pendleton, OR.                                    | 41021 | 41021   | 168 |
| Pendleton, OR.                                    | 41049 | 41021   | 168 |
| Seattle-Tacoma-Bremerton, WA (CMSA-91)            | 53033 | 53053   | 170 |
| Seattle-Tacoma-Bremerton, WA (CMSA-91)            | 53053 | 53053   | 170 |
| Seattle-Tacoma-Bremerton, WA (CMSA-91)            | 53061 | 53053   | 170 |
| Seattle-Tacoma-Bremerton, WA (CMSA-91)            | 53041 | 53053   | 170 |
| Seattle-Tacoma-Bremerton, WA (CMSA-91)            | 53035 | 53053   | 170 |
| Seattle-Tacoma-Bremerton, WA (CMSA-91)            | 53073 | 53053   | 170 |
| Seattle-Tacoma-Bremerton, WA (CMSA-91)s           | 53057 | 53053   | 170 |

## Appendix E. Market Share Analysis

In its January 16, 2026 decision, the Board concluded that the prior application was “incomplete because its impact analyses required by 49 C.F.R. § 1180.7(b) do not contain market share projections for the entity to be created by the Transaction that are consistent with the claims elsewhere in the Application that the new entity would experience growth by diverting traffic from trucks and other rail carriers.”<sup>217</sup> This section provides the requested additional data on projected post-merger market shares that are aligned and internally consistent with the diversion analyses presented in this report.

Market share projections were developed at the commodity- and lane-level that ensure consistency between the projected shares and the Applicants’ post-Transaction operating plans and diversion expectations. To do this, a data process was created that combined the 2023 actuals, as produced by CRA, and the diversion analysis to show the post-merger mature state of the freight transportation market, including the effects of the combined UP-NS network. The procedure to process the Transearch data and assign carrier revenues using reported lane-specific 2023 truck rates from the DAT and national averages for other non-rail modes is fully documented in the workpaper “market\_shares\_enhanced\_transearch\_full\_vF.sql.” This was combined with the diversion analysis outputs to create a comprehensive post-merger state for traffic (tons, carloads, and revenue by mode and rail route in each major commodity corridor).<sup>218</sup>

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<sup>217</sup> STB Finance Docket No. 36873, Decision No. 9, January 16, 2026.

<sup>218</sup> In developing future market share, I did not attempt to forecast broader, non-transaction-related changes in transportation markets that hypothetically could affect market shares, such as shifts driven by rising fuel costs or other macroeconomic factors. Undertaking such forecasts would require highly speculative assumptions regarding macroeconomic conditions across a wide range of dimensions, including by lane, commodity, and carrier, and would not reflect transaction-related impacts. I also did not attempt to predict how certain merger conditions such as 2-to-1 access, open gateways, or Committed Gateway Pricing (CGP) I did not attempt to predict how certain merger conditions such as 2-to-1 access, open gateways, or CGP might influence changes in transportation markets. I understand that Applicants’ 2-to-1 access and open gateway commitments are competition-preserving conditions, so they would not be expected by themselves to change pre-merger traffic flows. I also understand that CGP would apply only to interline movements between solely served customer facilities, so it would not be expected to result directly in diversions of traffic from one railroad to another. Forecasting how CGP’s impact on rates might influence traffic shifts

To create the data tables and meet the requirements for analysis by the Board, the following definitions were used in segmenting traffic (Exhibit E-1).

**Exhibit E-1: Traffic segmentation definitions**

|                                       |                                                                                                                                                                                                                                                                                                                                                                                                               |
|---------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Major point</b>                    | BEA                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Traffic flow</b>                   | Origin BEA to destination BEA                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>Corridor</b>                       | Origin BEA, destination BEA, rail route                                                                                                                                                                                                                                                                                                                                                                       |
| <b>Major commodity group</b>          | STCC4. This level of detail is the maximum level of detail available in Transearch                                                                                                                                                                                                                                                                                                                            |
| <b>Corridor-major commodity group</b> | Origin BEA, destination BEA, STCC4, route                                                                                                                                                                                                                                                                                                                                                                     |
| <b>Market</b>                         | Varies by diversion source and rail service type: <ul style="list-style-type: none"> <li>• R2R general merchandise and bulk: origin SPLC, destination SPLC</li> <li>• R2R automotive: origin SPLC, destination BEA</li> <li>• T2R merchandise: origin county (FIPS), destination county (FIPS)</li> <li>• All intermodal: origin BEA, destination BEA, with adjustments as described in Appendix D</li> </ul> |
| <b>Lane</b>                           | Origin SPLC, destination SPLC, STCC4                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Route</b>                          | Originating railroad – gateway – other railroads – other gateways – terminating railroad. This is either the CRA-reported route based on actual waybills (for 2023 traffic) or the Oliver Wyman Quantanet route (for diversion traffic) described in A.6.2 for rail traffic. For other modes, the route is the mode (e.g., truck)                                                                             |
| <b>Quad</b>                           | Used in the rail-to-rail model as the origin-originating railroad-destination-terminating railroad. The origin/destination geographic level of detail is unchanged from the rail-to-rail model described in Appendix A                                                                                                                                                                                        |

CRA provided the 2023 current state actuals. The tables used as inputs were Appendices D1, D2, E1, E2, E3, E4, F1, F2, F3, and F4. These enabled the creation of a single data table with all major commodity group flows on corridors, with fields for carloads, tons, and revenue.

The CRA 100% waybill file was used as the basis for rail-to-rail diversions and future state before truck-to-rail diversions. Solely for this market share analysis, the same filters CRA used were replicated and applied to generate 2023 current-state actuals. An example of this narrower

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between lanes and shipper locations would require highly speculative assumptions not only about railroad responses but also about shipper responses and circumstances in underlying product markets. Forecasting how CGP might influence rail traffic growth involves the same difficulties as forecasting growth from non-transaction-related changes in general macroeconomic conditions.

definition is the exclusion of revenue empties, which are considered addressable traffic for diversions in the rail-to-rail model. The calibrated rail-to-rail model was applied to this traffic to get to the post-merger state, with rail-to-rail diversions that align with the rail traffic used by CRA. Consequently, the rail-to-rail diversion presented in the market share tables is ~8% less than that presented in the diversion calculations and traffic used in the Operating Plan.

All STCC 50xx traffic with other modes, principally trucking, was converted to STCC 4611 to ensure that intermodal addressable freight was included in the base state actuals for 2023. This is important, because the post-merger state fully reflects the increase in intermodal drayage as a result of truck to intermodal diversions. Each diverted long-haul truckload results in one intermodal unit (carload) for rail and two shorthaul drayage moves to/from the intermodal terminal. These are classified as STCC 4611 in the market share tables.

There are cases where the diversions result in traffic shifting from one BEA to another. These are most apparent in intermodal, where terminal catchment areas for both rail-to-rail and truck-to-rail competition span multiple counties and do not align with the defined BEAs. As explained further below, the intermodal rail linehaul diversions are assumed to be to/from the county with the largest intermodal terminal, even if the operating plan would direct it to a terminal in a nearby county.

The rail-to-rail model is designed to predict share shift in carloads on a lane and infer tons and revenue based on national averages. The detail for a route is referred to as a “quad,” which is a unique combination of originating railroad, origin SPLC (or intermodal terminal catchment), terminating railroad, and destination SPLC (or intermodal terminal catchment or BEA for automotive). One route is generated for each “quad” with the lowest impedance (miles plus

junction impedance). To ensure a high level of consistency solely for this market share analysis, there are three methodological differences:

- Any quads with zero diversions were assigned pre-merger carloads, tons, and revenue (i.e. no change from actuals);
- For quads with diversions, cars were converted into tons based on actual tons per carload for each STCC4 in an origin to destination lane; and
- For quads with diversions, the standalone rail-to-rail model calculates pre- and post- revenue. Instead of using post- revenue directly, this model calculates quad post-revenue as a percentage of total pre- revenue across all quads. This percentage is applied to total actual 2023 revenue. Note that this both aligns revenue with actuals to account for regional and other variations and enables a clear quantification of expected overall shipper savings from switching from the interline to the single-line pricing curve.

The above is documented in detail in workpaper “R2R\_Diversions\_STCC4\_SPREAD.ipynb.” All rail-to-rail analysis was applied at the same geographic level of detail (i.e., intermodal is terminal group to terminal group, merchandise is SPLC-SPLC) as in the diversion analysis. The output of the market share analysis remains aligned with the actual BEAs for each freight station (FSAC, SCAC), whether traffic increases, decreases, or is unchanged. The model uses the routes generated by the Quantanet model pre- and post- merger. Where these do not align with actual routes used, the future state traffic for that actual route will be zero, but the traffic will instead appear in the data on the route predicted by the model in its entirety. Similarly, the Quantanet model may assign the post-merger traffic in a quad to a route that has zero actual traffic, because the railroads use a different gateway today. Traffic is never split between routes for a given quad. Note that the quads are then aggregated to

the BEA-BEA level for presentation in the market share tables, meaning a BEA-BEA-STCC4 with the same originating and terminating railroads can see traffic split across multiple routes.

The truck-to-rail diversions were applied on top of the rail-to-rail traffic. The truck-to-merchandise diversions were calculated using STCC2 and truck-to-intermodal diversions were calculated using terminal catchment areas. Proration was thus applied to distribute the calculated diversion tons (merchandise, auto) or units (intermodal) to the relevant truck records (geographically and by STCC4). The same diversion percentage was applied for all relevant truck traffic for each rail diversion. In the granular results, this leads to, for example, counties further from the intermodal terminal having the same diversion rate as counties close to the intermodal terminal, and uniform diversion rates across all STCC codes for intermodal and within an STCC2 for merchandise. This approximation means that there will be STCC4 commodities moving by rail that do not move by rail today, or are moved as STCC4611 Freight All Kinds today, meaning it is important to view the detailed results in this light.

In general, the truck-to-rail was applied as “adds” to rail routes, which are largely UP-NS single-line, and subtracted from truck mode. However, converting truckloads to intermodal creates a need for drayage trucking. The addition of dray requirements increased truck tons and revenue, which is visible in certain shorthaul lanes. This additional drayage traffic is coded as STCC4611 Freight All Kinds.

Truck-to-rail traffic revenue was estimated based on the same model described in Section 8 that uses national averages. Consequently, there will be granular data with revenue per ton variances between 2023 actuals and growth traffic. This decision was taken to remain consistent with the other revenue calculations in this Verified Statement.

Most truck-to-rail diversions are to a single-line route. The single material exception is truck-to-intermodal diversions originating or terminating in South Florida using the Florida East Coast Railway (“FEC”). The UP-NS revenue for this traffic was modeled using the end-to-end mileage with a junction frequency of 1, minus the FEC’s average revenue for local intermodal traffic. All other truck-to-rail diversions where the route is interline were considered de minimis and/or contract-dependent, and a high share of revenue on these would accrue to the merging carriers, with the remainder going to a shortline or switching carrier.

The total rail revenue increase will not match the diversion exhibits in Section 8 for five reasons, which are part of the decisions made to ensure alignment with the market share tables for the current state produced by CRA. These are:

- Tons: The exhibits in this statement use national average tons per car and fixed tons per intermodal unit, whereas in the market share analysis, diverted carloads are converted based on major commodity group traffic flow tons per car/intermodal unit.<sup>219</sup>
- Mileage: The exhibits in this statement use revenue calculated based on the shortest rail miles using the MultiRail network and assigned O/D. The market share analysis uses the shortest rail miles using the Quantanet network and places traffic at different locations (e.g., the Detroit Livernois intermodal terminal instead of the Toledo Airline intermodal terminal) to calculate revenue.
- Lanes: The exhibits in this statement use compressed traffic as loaded into the Operating Plan, whereas the market share analysis uses raw diversions. This is most important for truck to merchandise diversions, which are very fragmented. This will create differences in length-of-haul between the raw diversions and the compressed traffic.

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<sup>219</sup> Ibid.

- Rail-to-rail diversions: To align with the CRA current-state analysis, the same set of filters were applied to the 100% waybill data. These reduced addressable rail-to-rail traffic by ~5% (e.g., revenue empties, low-volume traffic flows), which reduced diverted traffic by ~8% and consequently the revenue shift to UP-NS.
- Assignment of revenue between UP-NS and other carriers on interline routes: For the revenue extended haul offsets described in Section 8 of this report, the same revenue model was applied as for other diversion traffic. The existing interline traffic which loses traffic will estimate revenue offsets based on a straight rate prorate of the mileage for UP, NS, and all other carriers. In addition to anchoring to the actual reported revenue on the route, this will create a difference with the Section 8 revenue estimates.

The following market share tables were produced, as shown in Exhibit E-2, which include all major commodity traffic flows that correspond to 80% of all current state UP and NS traffic. The projected increases in UP-NS market shares reflect diversions from truck and other rail competitors driven by improved service offerings. In turn, those shifts are a direct result of the merger's central benefit – creating new single-line service that customers demand – which is expected to generate growth and deliver public benefits through better service, lower costs, and greater reliability.

**Exhibit E-2: Market shares: all major commodity traffic flows**

Corresponding to 80% of current state UP and NS traffic

| File name                                        | Appendices included                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|--------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Appendix D1, D2_80pct_vFinal.xlsx</b>         | <ul style="list-style-type: none"> <li>• Appendix Table D1: Major Points: Originated Traffic in Carloads</li> <li>• Appendix Table D2: Major Points: Terminated Traffic in Carloads</li> </ul>                                                                                                                                                                                                                                                                                                          |
| <b>Appendix E1, E2, E3, E4_80pct_vFinal.xlsx</b> | <ul style="list-style-type: none"> <li>• Appendix Table E1: Major Corridor-Commodity Combination: Traffic Volumes by Mode Measured in Tons and Shares</li> <li>• Appendix Table E2: Major Corridor-Commodity Combinations: Rail Traffic Volumes by Route Measured in Tons and Shares</li> <li>• Appendix Table E3: Major Corridor-Commodity Combinations: Revenues by Mode and Shares</li> <li>• Appendix Table E4: Major Corridor-Commodity Combinations: Rail Revenues by Route and Shares</li> </ul> |
| <b>Appendix F1, F2, F3, F4_80pct_vFinal.xlsx</b> | <ul style="list-style-type: none"> <li>• Appendix Table F1: Commodities Traffic Volume in Carloads: by Major Origin</li> <li>• Appendix Table F2: Major Commodities Traffic Volume in Carloads: by Destination</li> <li>• Appendix Table F3: Major Commodities Revenues: by Origin</li> <li>• Appendix Table F4: Major Commodities Revenues: by Destination</li> </ul>                                                                                                                                  |

## Appendix F. Changes to Traffic Diversion Analysis from the December 2025 Verified Statement

The primary revision to the traffic diversion analysis was a change in the base rail traffic data, as summarized in Exhibit F-1. When traffic diversions were estimated for the Verified Statement (“VS”) filed in December 2025, 100% traffic data was available for only four of the six Class I railroads.

With 100% traffic data for the missing two railroads now available, the traffic diversions in this revised VS could be updated using 100% data for all six Class I railroads. Combining Class I data with the CCWS for non-Class I movements yielded the 100% waybill data file, which was used as a consistent data source across all diversions.<sup>220</sup>

**Exhibit F-1: Shift from CCWS to 100% WB data provided by Class I railroads**

|                         | Rail-to-rail (R2R)                         |                                            | Truck-to-rail (T2R)                   |                                      |
|-------------------------|--------------------------------------------|--------------------------------------------|---------------------------------------|--------------------------------------|
|                         | Historical data used for model calibration | Historical data used for diversions        | Historical rail share for merchandise | Historical rail share for intermodal |
| <b>December 2025 VS</b> | CCWS                                       | 100% waybill data for four Class Is + CCWS | CCWS                                  | CCWS                                 |
| <b>April 2026 VS</b>    | 100% waybill data                          | 100% waybill data                          | 100% waybill data                     | 100% waybill data                    |

Access to 100% traffic data for all Class I railroads allowed for more accurate capture of interline traffic, improving overall diversion model fidelity. The 100% waybill data file adjusts for Rule 11 rebilled shipments to provide the true rail origin and destination, including shipments interchanged between two railroads via trucks (i.e., “rubber tire” interchanges). As shown in Exhibit F-2, the CCWS includes 4.4 million rebilled carloads and intermodal units originated and delivered to another railroad, with the ultimate rail destination unknown.

<sup>220</sup> 100% waybill data consists of 2023 traffic records from BNSF, CN, CPKC, CSX, NS, and UP, plus the STB CCWS for non-Class I moves. The data was assembled by Charles River Associates to eliminate duplications and match “rubber-tire” interchanges.

**Exhibit F-2: Summary of interline traffic differences between CCWS and 100% waybill data<sup>221</sup>**

Revenue carloads and intermodal units originated, in thousands

|                              | Single-line<br>(JF=0,<br>Rebill=0) | Interline, no<br>rebill<br>(JF>0, Rebill=0) | Interline rebilled<br>(Rebill=1) | Percentage<br>interline | Unique OSPLC-<br>DSPLC-STCC2 <sup>222</sup> |
|------------------------------|------------------------------------|---------------------------------------------|----------------------------------|-------------------------|---------------------------------------------|
| <b>CCWS</b>                  | 21,875                             | 2,009                                       | 4,401                            | 23%                     | 124                                         |
| <b>100% waybill<br/>data</b> | 21,035                             | 8,134                                       | N/A                              | 28%                     | 238                                         |

Stitching together the waybills that form interline moves significantly increased the share of rail traffic moving interline, as shown in Exhibit 2-1. The largest change was to merchandise: an increase of 1.1 million carloads and 800,000 more interline cars. Intermodal saw a significant shift to interline because of linking rubber-tire interchanges, which also reduced the single-line unit count by approximately 2.1 million intermodal units. Full details are shown in Exhibit F-3.

**Exhibit F-3: Number of cars used in base analysis<sup>223</sup>**

Thousands of loaded cars and intermodal units and tons

|                    | Cars                             |                                             |            | Tons                             |                                             |            |
|--------------------|----------------------------------|---------------------------------------------|------------|----------------------------------|---------------------------------------------|------------|
|                    | CCWS data<br><i>Used in 2025</i> | 100% waybill<br>data<br><i>Used in 2026</i> | Difference | CCWS data<br><i>Used in 2025</i> | 100% waybill<br>data<br><i>Used in 2026</i> | Difference |
| <b>Intermodal</b>  |                                  |                                             |            |                                  |                                             |            |
| Single-line        | 10,476                           | 8,641                                       | (1,835)    | 145,428                          | 133,869                                     | (11,560)   |
| Total interline    | 1,814                            | 2,215                                       | 402        | 22,441                           | 30,667                                      | 8,226      |
| Interline          | 629                              | 2,215                                       | 1,587      | 8,689                            | 30,667                                      | 21,979     |
| Rebill = 1         | 1,185                            | -                                           | (1,185)    | 13,753                           | -                                           | (13,753)   |
| Total              | 12,290                           | 10,856                                      | (1,434)    | 167,870                          | 164,536                                     | (3,334)    |
| <b>Merchandise</b> |                                  |                                             |            |                                  |                                             |            |
| Single-line        | 5,134                            | 5,423                                       | 289        | 498,301                          | 509,383                                     | 11,082     |
| Total interline    | 2,966                            | 3,761                                       | 794        | 272,613                          | 334,838                                     | 62,225     |
| Interline          | 995                              | 3,761                                       | 2,766      | 90,359                           | 334,838                                     | 244,479    |
| Rebill = 1         | 1,972                            | -                                           | (1,972)    | 182,254                          | -                                           | (182,254)  |
| Total              | 8,100                            | 9,184                                       | 1,084      | 770,914                          | 844,221                                     | 73,307     |

<sup>221</sup> See workpaper “C-Appendix F Exhibits vFinal.xlsx.”

<sup>222</sup> STCC2 is the first two digits of the commodity code without the hazardous material codes.

<sup>223</sup> See workpaper “CRA CCWS Comparison.xlsx.”

|                 | Cars                             |                                             |            | Tons                             |                                             |            |
|-----------------|----------------------------------|---------------------------------------------|------------|----------------------------------|---------------------------------------------|------------|
|                 | CCWS data<br><i>Used in 2025</i> | 100% waybill<br>data<br><i>Used in 2026</i> | Difference | CCWS data<br><i>Used in 2025</i> | 100% waybill<br>data<br><i>Used in 2026</i> | Difference |
| <b>Bulk</b>     |                                  |                                             |            |                                  |                                             |            |
| Single-line     | 4,514                            | 4,550                                       | 36         | 492,174                          | 499,116                                     | 6,942      |
| Total interline | 1,024                            | 1,094                                       | 70         | 116,727                          | 122,810                                     | 6,083      |
| Interline       | 338                              | 1,094                                       | 756        | 37,482                           | 122,810                                     | 85,329     |
| Rebill = 1      | 686                              | -                                           | (686)      | 79,245                           | -                                           | (79,245)   |
| Total           | 5,538                            | 5,644                                       | 106        | 608,902                          | 621,927                                     | 13,025     |
| <b>Auto</b>     |                                  |                                             |            |                                  |                                             |            |
| Single-line     | 448                              | 449                                         | 0          | 8,924                            | 8,931                                       | 8          |
| Total interline | 495                              | 656                                         | 161        | 9,747                            | 13,794                                      | 4,047      |
| Interline       | 39                               | 656                                         | 617        | 788                              | 13,794                                      | 13,006     |
| Rebill = 1      | 456                              | -                                           | (456)      | 8,959                            | -                                           | (8,959)    |
| Total           | 943                              | 1,104                                       | 161        | 18,670                           | 22,725                                      | 4,055      |
| <b>All</b>      |                                  |                                             |            |                                  |                                             |            |
| Single-line     | 20,572                           | 19,062                                      | (1,509)    | 1,144,828                        | 1,151,299                                   | 6,471      |
| Total interline | 6,299                            | 7,726                                       | 1,427      | 421,528                          | 502,110                                     | 80,582     |
| Interline       | 2,000                            | 7,726                                       | 5,726      | 137,318                          | 502,110                                     | 364,792    |
| Rebill = 1      | 4,299                            | -                                           | (4,299)    | 284,211                          | -                                           | (284,211)  |
| Total           | 26,871                           | 26,789                                      | (82)       | 1,566,356                        | 1,653,409                                   | 87,053     |

Full visibility of rebill traffic, most of which crosses the Mississippi watershed, improves the accuracy of the diversion analysis. Comparing the 100% waybill data with the CCWS shows a decrease of 845,000 waybills in single-line traffic. The interline traffic, in terms of cars originated, increases from 6.4 million to 8.1 million. The 100% waybill data stitches together intermodal rubber tire interline moves (in many cases replacing two single-line waybills with a one interline waybill) and the rebills.

Additionally, the 100% waybill data has nearly twice the number of markets than the CCWS, if a market is defined as an origin SPLC, destination SPLC, and 2-digit STCC. This has three impacts:

- Markets that previously showed zero rail market share now accurately reflect rail service.

- Low-volume markets sampled in the CCWS may overstate rail traffic due to expansion to represent a total of 100% of rail volume: Whereas the actual 100% waybill data has many markets with only one or two cars, the CCWS shows a minimum of five cars due to the sample expansion factor.
- Intermodal terminals – previously defined as counties where the CCWS originated or terminated ServiceType = 2 traffic – are now more accurately defined as locations with domestic intermodal traffic. This removes several small, international-only intermodal terminals (e.g. Amarillo, TX). The impact on the total addressable market is greatly reduced because there is significant trucking in the catchment areas for these terminals, that lack domestic service today and cannot receive UPNS domestic service in the future.

Exhibit F-4 provides an example of how having an accurate historical rail share is important for the diversion model. This example involves truck-to-merchandise diversion.<sup>224</sup> Historical truck tons were unchanged at 29,000 but rail tons increased from zero (CCWS) to 14,000 (100% waybill data). Thus, the historical rail share was 33% rather than zero. The lane characteristics are used to average rail share across all rail data to create archetypes used in the lookalike model (see Appendix B.5.2.C. for an explanation of the lookalike model). The lane characteristics include length of haul in miles, range for rail price, range for rail transit time in hours, and for the updated 2026 model, a flag indicating single-line or interline.

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<sup>224</sup> Locations and commodities in Exhibit F-3 are not provided to protect rail volume confidentiality.

**Exhibit F-4: Example of how 100% traffic data improves diversion model accuracy<sup>225</sup>**

| Verified Statement | 2023 truck tons | 2023 rail tons | 2023 market tons | Historical rail share | Lane characteristics                               | Target rail share | Est. rail tons post-merger | Est. tons diverted | Est. rail carloads diverted | Percent diverted |
|--------------------|-----------------|----------------|------------------|-----------------------|----------------------------------------------------|-------------------|----------------------------|--------------------|-----------------------------|------------------|
| <b>Dec-25</b>      | 28,940          | -              | 28,940           | 0%                    | 1500-1749  <br>0.0498 - 0.0581<br> <br>230-244     | 45%               | 13,014                     | 13,014             | 135                         | 45%              |
| <b>Apr-26</b>      | 28,940          | 14,376         | 43,316           | 33%                   | 1500-1749  <br>0.0498 - 0.0581<br> <br>230-244   S | 45%               | 19,376                     | 5,000              | 52                          | 17%              |

For both the December 2025 result and the April 2026 result shown above, the target rail share based on the lane characteristics was 45%. In December 2025, there were an estimated 135 carloads diverted to bring rail from a zero share to a 45% share. In April, since rail already had a 33% share, the diversion estimate was reduced to 52 carloads.

There were additional adjustments to the input data and model that had small impacts on the results. These changes included removing double-counting of truck traffic in Miami-Dade County, specific counties in Connecticut, and the Mexican state of Baja, California, which have duplicate references in the Transearch database; incorporating a more accurate mapping of diversions to historical commodities; utilizing a region-to-region based pricing approach for

<sup>225</sup> See workpaper “C-Appendix F Exhibits vFinal.xlsx.” Locations and commodity in Exhibit F-4 are not provided to protect rail volume confidentiality.

intermodal linehaul price instead of a regression model to define market archetypes; and concentrating auto diversions into a smaller number of larger auto ramp facilities.

Although estimated diversions did change in individual origin-destination-commodity lanes and across service types, the bottom line is similar. The net diversion after adjusting for extended haul and long-haul drayage offsets did not change (Exhibit F-5).

**Exhibit F-5: Change in diversions from the Dec. 2025 VS to the ~~Aug~~ Sep. 2026 VS<sup>226</sup>**

Carloads and intermodal units in thousands

|                               | Merchandise |      |         | Intermodal |       |         | Bulk |      |         | Auto |      |         | Total |       |         |
|-------------------------------|-------------|------|---------|------------|-------|---------|------|------|---------|------|------|---------|-------|-------|---------|
|                               | 2025        | 2026 | % Diff. | 2025       | 2026  | % Diff. | 2025 | 2026 | % Diff. | 2025 | 2026 | % Diff. | 2025  | 2026  | % Diff. |
| <b>Total gross diversions</b> | 346         | 314  | -9%     | 1,438      | 1,532 | 7%      | 28   | 31   | 10%     | 52   | 58   | 11%     | 1,864 | 1,934 | 4%      |
| <b>Offsets</b>                | -71         | -84  | 18%     | -198       | -252  | 27%     | -34  | -34  | 1%      | -26  | -32  | 24%     | -329  | -402  | 22%     |
| <b>Net diversions</b>         | 275         | 230  | -16%    | 1,239      | 1,280 | 3%      | -6   | -4   | -41%    | 26   | 26   | -1%     | 1,535 | 1,532 | -0%     |

<sup>226</sup> See workpaper “C-Appendix F Exhibits vFinal.xlsx.”

## Appendix G. Witness Qualifications

### David T. Hunt

Mr. Hunt, a Vice President in Oliver Wyman's Transportation practice, has over 40 years of experience in the areas of transportation operations and strategic planning, national and regional transportation policy, and network modeling and operations research. Mr. Hunt focuses on projects involving regulatory and policy analysis, strategic planning, and operational improvements. His projects include:

- Developed truck-to-rail and rail-to-rail diversion analyses for the merger of two Class I railroads, both for the entirety of the merged railroads and for a potential line spinoff.
- Developed a market share model that predicted truck/rail shares and volumes under various scenarios, including autonomous truck technologies and the potential responses by the rail industry.
- Prepared several policy white papers filed with the US Department of Transportation, addressing issues such as positive train control, use of electronically controlled pneumatic brakes, single-person crews, and open access of the US rail network.
- Called as an expert witness in rail capacity modeling as part of an international arbitration case in South America.
- Participated in discussions with the Mexican government that led to a favorable ruling for the rail industry regarding proposed regulatory action to promote competition through expanded interconnection of rail services.
- Managed the design and development of BlueNet, a facility location model used in network design.
- Developed a simulation model that showed the benefits of operating a nationwide railcar pool, the results of which were used in a Surface Transportation Board proceeding to reauthorize the operation of the pool.
- Worked with a Class I North American railroad to explore opportunities and value of adopting predictive maintenance practices for their railcar fleet.

Prior to joining Oliver Wyman, Mr. Hunt was a Senior Associate at Cambridge Systematics (CS). Mr. Hunt was also a Vice President at ALK Associates where he participated in several Class I railroad mergers by estimating rail-to-rail traffic diversions using the Princeton Transportation Network Model Advanced Traffic Diversion software (PTNM-ATD).

Mr. Hunt was the 2025 president of the Institute for Operations Research and the Management Sciences (INFORMS), where he was the recipient of the 2017 INFORMS President's Award.

Mr. Hunt earned a BS in civil engineering from West Virginia University and a MSE from the Civil Engineering and Operations Research Department at Princeton University.

## Appendix H. Glossary

| Acronym | Definition                                  |
|---------|---------------------------------------------|
| BEA     | Bureau of Economic Analysis Economic Area   |
| CIF     | Customer Identification File                |
| CCWS    | STB Confidential Carload Waybill Sample     |
| CFS     | Commodity Flow Survey                       |
| CRA     | Charles River Associates                    |
| DBEA    | Destination BEA                             |
| DRR     | Destination railroad                        |
| DSPLC   | Destination Standard Point Location Code    |
| DTG     | Destination terminal group                  |
| FAF     | Freight Analysis Framework                  |
| FIPS    | Federal Information Processing Standards    |
| FMCSA   | Federal Motor Carrier Safety Administration |
| FSAC    | Freight Station Accounting Code             |
| GTM     | Gross ton-miles                             |
| OEM     | Original equipment manufacturer             |
| ORR     | Origin railroad                             |
| OSPLC   | Origin Standard Point Location Code         |
| OTG     | Origin terminal group                       |
| PUWS    | STB Public Use Waybill Sample               |
| SCAC    | Standard Carrier Alpha Code                 |
| SCRS    | Serving Carrier Reciprocal Switching        |
| SPLC    | Standard Point Location Code                |
| STCC    | Standard Transportation Commodity Code      |