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BEFORE THE
SURFACE TRANSPORTATION BOARD

Finance Docket No. 36873

UNION PACIFIC CORPORATION and
UNION PACIFIC RAILROAD COMPANY

—CONTROL—

NORFOLK SOUTHERN CORPORATION and
NORFOLK SOUTHERN RAILWAY COMPANY

SUSTAINABLE ENGLEWOOD INITIATIVE'S OPENING COMMENTS AND REQUESTS FOR CONDITIONS

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I. Introduction

Pursuant to 49 U.S.C. § 11325 and Decision No. 30 in the above-captioned proceeding, Sustainable Englewood Initiatives ("SEI") submits these comments and requests for mitigation conditions on the proposed merger (the "Proposed Transaction") between Norfolk Southern Corporation and Norfolk Southern Company ("NS") and Union Pacific Corporation and Union Pacific Railroad Company ("UP") (collectively, "Applicants"), as reflected in the Amended Railroad Control Application filed on April 30, 2026, as supplemented on July 7 and July 27, 2026 (collectively, the "Application").

SEI is a community organization representing Englewood, a neighborhood of Chicago that hosts Norfolk Southern's "busiest" intermodal hub: the 47th Street Yard.[1] Given that Applicants' Proposed Transaction will concentrate even more intermodal freight activity at the 47th Street Yard, Englewood will be among the communities most impacted if the Board approves the Application. Applicants claim the Proposed Transaction will deliver economic benefits, reduced truck traffic, and "reduced emissions and improved air quality" for the country.[2] Setting aside whether the record developed in this proceeding supports these bold claims of nationwide benefit, the Board's ultimate determination turns on weighing the potential benefits against all of the harms of the Proposed Transaction. And the record is clear that if the Proposed Transaction is allowed, specific communities across the country will experience surging train, truck, and railyard activity and a panoply of related harms. Englewood, already home to NS's busiest yard, will see significant local transportation disruptions and increases in air pollution and other quality of life harms. SEI submits these comments to remind Applicants that they can only realize asserted nationwide benefits by subjecting Englewood residents to increased rail traffic, increased truck traffic, and increased intermodal activity at the 47th Street Yard—and to ask this Board to mitigate the harms resulting from those changes.

The Board is considering the Proposed Transaction under the new major merger rules, which strengthened consideration of local impacts and require the Board to balance localized harms against the asserted benefits and to include appropriate mitigation measures in any final order approving the Application. The concern that well-being in Englewood might be sacrificed for nationwide economic benefit is not hypothetical: it is a familiar experience to Englewood, a community that has seen the very same harms accumulate over a century as passenger rail has been replaced by freight at the 47th Street Yard. SEI does not ask the Board to remedy that history, but it provides crucial context to understand how the Proposed Transaction will further

[1] *International Railway Journal Names Yannik Thomas to Its 2023 Young Leaders in Rail List*, Norfolk Southern (Dec. 15, 2023), https://www.norfolksouthern.com/en/newsroom/story-archive/2023/international-railway-journal-names-yannik-thomas-to-its-2023-young-leaders-in-rail-list.

[2] Revised Application ("Rev. Appl.") 1-21.

harm Englewood and what conditions on approval might mitigate those harms. And that is part of the task before the Board under the relevant statutes and regulations.

These comments proceed as follows: Section II describes Englewood's deep connections with American rail and the impacts of every successive change to the 47th Street Yard, demonstrative of the additional harms that will be imposed by the Proposed Transaction. Section III explains that the heightened public interest standard to which this transaction is held demands that merger-related harms in Englewood be considered and mitigated. In Sections IV and V, we detail those harms based on Application materials, supplemental information, and independent expert analyses.[3] Section IV demonstrates that the Proposed Transaction would result in a dramatic increase in rail and truck traffic in Englewood. Section V explains the well-documented transportation, health, and quality-of-life harms associated with those merger-related traffic increases. As to each set of impacts, SEI proposes specific mitigation conditions.

As expanded and explained in detail throughout these comments, SEI requests that in any order approving the Proposed Transaction, the Board include the following conditions to mitigate harms in Englewood:

- **Impose the specific mitigation measures identified in Section V of these comments** as to each category of harm that the Proposed Transaction will impose on Englewood, including:
    - Accessibility, mobility, and local transportation measures.
    - Noise and vibration measures.
    - Light and heat measures.
    - Air quality measures.

[3] On November 17, 2026, the eve of the deadline to submit comments, NS supplemented its initial responses to SEI's interrogatories, served on September 28, 2026. These interrogatories requested information critical to assessing post-merger shipping activity and related impacts at and around the 47th Street Yard, including details regarding yard equipment and locomotives operating there, truck trips, truck access routes and corridors, and gate transaction information. NS responded to these interrogatories on October 13, 2026, generally objecting to them. But November 3, 2026—21 days after NS's initial responses—came and went, and SEI heard nothing from NS regarding a possible supplemental production, as required under the Discovery Guidelines. *See Union Pac. Corp.—Control—Norfolk S. Corp.* (*Decision No. 24*), FD 36873 et al., slip op at 4 (STB served June 18, 2026). Lacking this information, the researchers supporting SEI approximated 47th Street Yard activity using publicly available information to assess anticipated traffic changes and related impacts. SEI submits these comments now with those analyses and reserves the right to supplement its timely opening comments with refined analysis based on NS's late discovery responses.

- Hazardous materials measures.
- Land and water contamination measures.

- **Establish a Community Mitigation Fund**, paid into by the Applicants and administered by Englewood residents and local officials, or at a minimum with the structured, meaningful direction of Englewood residents and local officials, through which the measures above and other community-directed mitigation of the transaction's residual local harms may be funded and carried out. Funding from Applicants should reflect anticipated types of harm described below and be structured as lump sum allocations corresponding to those harms alongside a per-Yard-truck-trip fee structure.

- **Require Applicants to engage local stakeholders** by requiring Applicants (1) to host annual or more frequent tours of the 47th Street Yard and meetings with local stakeholders including Englewood school, church and community groups, local industry representatives as well as City, State and other government officials to both view conditions at the Yard and provide a forum to resolve community impacts issues; and (2) consult with relevant stakeholders before selling or redeveloping yards in Chicago that are idled as a result of the Proposed Transaction.

- **Provide for continued oversight of the Applicants' compliance with mitigation conditions** by requiring a lengthy reporting, monitoring and Board oversight period to ensure the Applicants' compliance with approval conditions.

Ultimately, SEI requests only that if the Board approves the Proposed Transaction, its final order also impose binding and enforceable conditions and commitments to ensure the residents of Englewood will be supported just as they continue to support the railways—commitments that would enable Englewood to continue being a part of America's rail economy, as the community has always been.

II. Englewood's Historic Partnership with American Rail

The Englewood community is not just reliant on or impacted by rail operations: it was built around rail. What is now described by Applicants as the "47th Street Yard"[4] first opened in 1852 and was later named "Englewood Union Station; it was constructed at the crossing of several major rail lines and went on to serve as a critical node in Chicago's rise as a national freight and passenger rail center.[5] A settlement called "Junction Grove" grew there to support the

[4] Rev. Appl. 2-708.

[5] Eva Verner, *Englewood Union Station*, 9 Expositions Magazine (2025), https://cegu.uchicago.edu/2024/12/06/union-station.

original Englewood Union Station.[6] That settlement was annexed to the City of Chicago in 1889, its original name reflecting its inseparability from the railroads.

It's no surprise, then, that Englewood is a neighborhood whose fortunes rise and fall with rail operations and the 47th Street Yard in particular. Over the nineteenth and early twentieth centuries, Englewood Union Station and the railroads serving it fueled spectacular growth in the neighborhood; by the 1940s, its shopping district was an "economic stronghold . . . Chicago's second largest commercial enterprise outside of the downtown Loop area."[7] Englewood once was an archetypical success story for American rail, with passenger rail driving local economic growth while the community helped sustain the growing railroads.

The community's fortunes turned for the worse, however, as passenger rail services were concentrated downtown and rail facilities in Englewood converted to handle freight. With an increase in freight traffic came an increase in emissions, pollution, and associated health hazards. The associated decrease in passenger rail, however, left the community without the investment necessary to combat those challenges; while passenger rail was an economic driver for the neighborhood by bringing people and local commerce into Englewood, freight investment brought goods *through* Englewood, so benefits flowed to communities elsewhere.[8] This was compounded by broader trends of disinvestment in Englewood through the mid-twentieth century, as the Black population increased and wealthier white residents began moving to the suburbs.[9] By the late-twentieth century, then, the neighborhood was stuck in a doom loop it could not escape: facing disinvestment across the board, with the transition from passenger to freight rail concentrating health, environmental and safety burdens in the community while simultaneously taking away its economic capacity to address those challenges.

That is how we find Englewood today: passenger rail serving Englewood Union Station has been replaced entirely by freight running through the 47th Street Yard. The neighborhood is

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[6] John R. Schmidt, *Englewood, Past and Present*, WBEZ Chicago (Mar. 31, 2012), https://www.wbez.org/2012/05/31/englewood-past-and-present.

[7] Maria Lettiere Roberts & Richard Stamz, *Chicago's Englewood Neighborhood: At the Junction* 55 (2002).

[8] It is widely acknowledged that freight traffic—and intermodal terminals in particular—do not deliver benefits specifically to the communities they are in. *Policy Options for Intermodal Freight Transportation*, Transportation Research Board, at 81 (1998) ("[T]he economic benefit of the freight traffic is distributed nationwide whereas the environmental costs are disproportionately local. In certain circumstances, the local community can capture some of the national benefit as recompense for the local costs."); *Freight Intermodal Connectors Study*, U.S. Dep't of Transp. (May 1, 2020), https://ops.fhwa.dot.gov/publications/fhwahop16057/sec4.htm ("[Intermodal connectors] often facilitate economic activity that yields benefits across a wide geographic scale though the negative externalities are borne locally.").

[9] *A Century on 63rd St. (1920-2020)*, University of Chicago: Chicago Studies, https://chicagostudies.uchicago.edu/centuries/63rd.

still a load-bearing pillar of American rail, but under-resourced and vulnerable to changes in the industry it continues to support. In 1997, the yard was owned by CSX Intermodal, Inc. ("CSX") which constructed an intermodal facility at the site—the 47th Street Yard. By 2008, Norfolk Southern owned the 47th Street Yard and proposed to double the size of its storage yard.[10] That project has proceeded in phases and is ongoing, with Norfolk Southern promising the public benefit of rail decongestion, a set of onsite equipment improvements, and a community benefits fund in exchange for City approvals that allowed the company to take over public streets and harness eminent domain to force people from their homes.[11] While Norfolk Southern implemented onsite equipment upgrades that it characterized as a community benefit, much of the remaining community benefit funds it contributed to the City remain unaccounted for.[12]

Englewood has continued to serve American rail and consumers by accommodating the growing intermodal facility, but its residents have subsidized the national freight system with their bodies. Freight trains release fine particulate matter ($PM_{2.5}$) which is linked to asthma, heart disease, and other health issues. Englewood has the highest rate of youth asthma ER visits in Chicago,[13] and asthma affects over a fifth of Englewood adults—twice the rate of the city as a whole.[14] Nitrogen dioxide (NO_2) and diesel exhaust from the yard present risk of respiratory damage in nearby residents and local cancer clusters from long-term exposure. Rates of lung cancer and chronic obstructive pulmonary disease (COPD) are nearly twice as high in

[10] Heather Cherone, *Englewood Rail Yard Expansion Back on Track With Ald. Taylor's Support*, WTTW (Feb. 1, 2023), https://news.wttw.com/2023/02/01/englewood-rail-yard-expansion-back-track-ald-taylors-support.

[11] La Risa Lynch, *Rail Yard Expansion in Englewood Raises Questions of Eminent Domain's Scope*, Chicago Reporter (Mar. 5, 2017), https://www.chicagoreporter.com/rail-yard-expansion-in-englewood-raises-questions-of-eminent-domains-scope.

[12] John Lippert, *Truck and Rail Backups Are Clogging Roads, Creating More Pollution and Raising Health Risks for Chicagoans Near Freight Corridors*, Chicago Tribune (Oct. 23, 2022), https://www.chicagotribune.com/2022/10/03/truck-and-rail-backups-are-clogging-roads-creating-more-pollution-and-raising-health-risks-for-chicagoans-near-freight-corridors.

[13] *Community Health Needs Assessment*, Holy Cross Hospital 30 (2025), https://www.sinaichicago.org/wp-content/uploads/2025/06/2025_CHNA-HCH.pdf.

[14] *Chicago Health Atlas: Englewood*, Chicago Department of Public Health et al., https://chicagohealthatlas.org/neighborhood/1714000-68?place=englewood&tab=data (adult asthma rates in 2023–2024: 22.0% of adults with asthma in Englewood, against 10.7% in Chicago as a whole).

Englewood than in Chicago as a whole.[15] And people in Englewood are dying from these respiratory diseases at nearly double the City's rate.[16]

Not only do the people of Englewood bear these health burdens related to freight operations, but the broader history of disinvestment in their community also means that the impacts of freight pollution have more impact in Englewood than if they occurred elsewhere. For example, Englewood has just around half the number of primary care providers per capita as compared to the city as a whole.[17] Less than 30% of Englewood residents have employment-based health insurance, while that rate is nearly 55% citywide.[18] The rate of people entirely uninsured is almost 25% higher in Englewood than for the city.[19] These health vulnerabilities of the Englewood community make the impacts of future increases in pollution more dire than if the same increase in freight pollution occurred in less densely populated places, or places with greater health care resilience and resources.

SEI recognizes, of course, that freight rail is not the only contributor to these health challenges in Englewood. SEI further acknowledges that this proceeding is focused not on historic or current impacts of rail on the public but on assessing what the impacts of the proposed merger will be moving forward. But this context illustrates what those impacts will be, because the community has already borne them with every successive change to the 47th Street Yard. Englewood is an already vulnerable community that knows its fortunes are tied to the rail industry, but it is also being asked to bear higher and higher costs of that industry's growth with every passing decade. SEI is not asking the Board to require UP and NS to remedy all of these ills. But SEI implores the Board to ensure the Proposed Transaction does not make those ills worse, and to ensure merger-related harms are mitigated. The public interest standard to which this merger is held provides guidance on how to do so.

III. Standard of Review

Rail operations, particularly intermodal freight activity at the 47th Street Yard, have always had a significant impact on the quality of life for people in Englewood, and unless mitigation conditions are required by the Board, the Proposed Transaction would impose

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[15] *Id*. (lung cancer diagnosis rates in 2017–2021: 111.1 per 100,000 residents in Englewood, against 63.8 per 100,000 in Chicago as a whole; and COPD rates in 2023: 11.5% of adults in Englewood, against 5.6% in Chicago as a whole).

[16] *Id*. (lung and bronchus cancer mortality rates in 2020–2024: 44.2 per 100,000 residents in Englewood, against 27.1 in Chicago as a whole).

[17] *Id*. (primary care providers per capita in 2011: 68.2 physicians per 100,000 residents in Englewood, against 107.7 in Chicago as a whole).

[18] *Id*. (employment-based health insurance rates in 2020–2024: 28.2% of adults in Englewood, against 53.9% in Chicago as a whole).

[19] *Id*. (uninsured rates in 2020–2024: 12.2% of adults in Englewood, against 9.8% in Chicago as a whole).

massive harms on this community. This section addresses the Applicants' burden to present and address such harms and the Board's statutory duty to assess and order appropriate mitigation.

The Board can approve the Proposed Transaction only if the Applicants prove that it meets a broad public interest test and only after the Board requires mitigation of transaction-related harms. We outline four key considerations for the Board as it applies the 2001 revisions to the major merger rules for the first time. First, the Board may approve the Proposed Transaction only if it is "consistent with the public interest;"[20] the best reading of that standard includes evaluation of the environmental, public health, and public safety harms the Proposed Transaction will impose, not merely its effects on the rail industry. Second, the 2001 revisions to the major merger rules place a heavier burden on Applicants to show the Proposed Transaction is in the public interest, including by strengthening consideration of a merger's impacts on communities. Third, the standard requires the Board to mitigate as many harms as possible before it balances the benefits against the remaining harms, so a mitigable harm must be addressed by condition rather than excused by an offsetting benefit. Fourth and finally, any findings of nationwide benefits do not relieve the Board of its duty to weigh and mitigate the localized harms concentrated in Englewood and other communities across the nation.

A. Public Interest Standard

The first two considerations are addressed here; the second two in the following subsection.

First, the Board may approve the Proposed Transaction only if it finds it to be "consistent with the public interest."[21] In applying that broad standard, the Board "shall consider at least" five statutory factors, including "the effect of the proposed transaction on the adequacy of transportation to the public."[22] But these statutory factors are the floor, not the ceiling; the statute directs the Board to consider "at least"[23] these factors[24] and Congress has identified additional considerations that should be accounted for when regulating the railroad industry.

Congress set out those considerations in the Rail Transportation Policy, a statutory declaration issued as part of the Interstate Commerce Commission Termination Act. This Act created the Surface Transportation Board and the modern rail regulatory regime it is charged with administering.[25] There, Congress declared it to be "the policy of the United States

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[20] 49 U.S.C. § 11324(c).

[21] *Id.*

[22] *Id.* § 11324(b).

[23] *Id.*

[24] *Id.* § 11324(c).

[25] *See* ICC Termination Act of 1995, Pub. L. No. 104-88, 109 Stat. 803 (creating the Surface Transportation Board and codifying the rail transportation policy at 49 U.S.C. § 10101).

Government . . . to operate transportation facilities and equipment without detriment to the public health and safety" and "to encourage and promote energy conservation."[26] Because section 11324 (the section that requires a public interest review) and section 10101 (the section on Rail Transportation Policy) sit within the same statutory scheme,[27] and the Rail Transportation Policy declares itself to be "the policy of the United States Government" for the regulation of rail transportation, the two provisions must be read together. The Supreme Court has long instructed that "the words of a statute must be read in their context, and with a view to their place in the overall statutory scheme."[28] Read in that light, for the Board to find that a transaction is "consistent with the public interest" under section 11324, it must also be consistent with the public health, public safety, and environmental policies Congress declared in section 10101.

The Board has previously recognized that this Congressional direction to include those priorities applies to its public interest analysis: "The Board's consideration of the merger or control of at least two Class I railroads is governed by the public interest criteria prescribed in 49 U.S.C. 11324 and the rail transportation policy set forth in 49 U.S.C. 10101."[29] Therefore, public health and public safety concerns are considerations expressly identified by Congress as necessary to consider when regulating the railroad industry. The scope of the "public interest" under section 11324 is a legal question, and the best interpretation of that statute requires the Board to operationalize the national policy codified in the Rail Transportation Policy and include environment, public health, and public safety concerns in its public interest analysis.

Second, this public interest standard is heightened under the new major merger rules, applicable here, relative to the pre-2001 rules. The Board's major merger policy overhaul in 2001 reflected "a significant change" in how the public interest standard is applied and imposed a "heavier burden" on merger applicants "to show that a major rail combination is consistent

[26] 49 U.S.C. § 10101(8), (14).

[27] Both provisions are found in Part A (Rail) of Subtitle IV (Interstate Transportation) of Title 49 of the U.S. Code.

[28] *Davis v. Mich. Dep't of Treasury*, 489 U.S. 803, 809 (1989) ("[S]tatutory language cannot be construed in a vacuum. It is a fundamental canon of statutory construction that the words of a statute must be read in their context, and with a view to their place in the overall statutory scheme."); *see also FDA v. Brown & Williamson Tobacco Corp.*, 529 U.S. 120, 133 (2000) (explaining that a court must interpret a statute "as a symmetrical and coherent regulatory scheme" and "fit, if possible, all parts into an harmonious whole" (internal quotations omitted)).

[29] 49 C.F.R. § 1180.1(b).

with the public interest."[30] These new rules have "strengthened consideration of a merger's impacts on communities."[31]

The new rules, adopted through notice and comment rulemaking procedures, do not expand the Board's existing statutory mandate under sections 11324 and 10101; rather, the current regulations merely reflect the non-exhaustive nature of the statutes and read section 11324 consistently with other statutory considerations that bear on the merger review standard. As explained above, section 11324 is non-exhaustive by its "at least" terms, and the Rail Transportation Policy is itself a statutory command, so the 2001 regulations explain and apply the national rail policy that Congress enacted. Thus, the current regulations articulate a standard that is both more faithful to the underlying statutes and materially more demanding than the pre-2001 policy. While the pre-2001 policy required only that transaction-related harms, after the imposition of appropriate conditions, be offset by corresponding public benefits, the 2001 rules place a "heavier burden" on applicants to affirmatively demonstrate that the combination is "consistent with the public interest."[32]

And the Board's regulations expressly identify environmental issues as a standalone public interest consideration. In determining the public interest, "the Board must consider . . . environmental safeguards."[33] So the evaluation of environmental harms is explicitly required as part of the public interest balancing itself, with the Board's ultimate decisions informed by the environmental review conducted under the National Environmental Policy Act ("NEPA"). The environmental, public health, and public safety concerns identified below are therefore not supplemental to the public interest inquiry, but an integral part of it and appropriate bases for the Board to condition or deny approval of the Proposed Transaction.

The Canadian Pacific Railway and Kansas City Southern ("CP–KC") transaction, though decided under the less demanding older regulations, remains useful guidance for this proceeding, which is the Board's first application of the new heightened standards. Even under the pre-2001 standard, the Board's final decision in the CP–KC matter relied on and adopted the Final Environmental Impact Statement, considered rail safety and the applicants' Safety Integration Plan, imposed environmental impacts mitigation measures as conditions of the merger approval, and established a multi-year oversight period to monitor compliance.[34] If the pre-2001 standard supported environmental conditions, safety review, and ongoing oversight, then the applicable

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[30] *Major Rail Consolidation Procedures* (Major Merger Rules), 5 S.T.B. 539, 546 (2001)

[31] *See Union Pac. Corp.—Control—Norfolk S. Corp. (Decision No. 21)*, FD 36873 et al., slip op. at 18 (STB served May 28, 2026).

[32] *Id.*

[33] 49 C.F.R. § 1180.1(b).

[34] *See Canadian Pac. Ry.—Control—Kan. City S. (Decision No. 35)*, FD 36500, App. C (STB served Mar. 15, 2023) ("CP–KC Decision No. 35") (listing environmental mitigation conditions); *id.* at 4 (considering safety and the Safety Integration Plan).

heightened standard provides even firmer footing for considering community-specific harms and imposing community-specific conditions.

From the perspective of Englewood, a residential community that hosts a massive intermodal yard where local freight traffic will increase dramatically as a result of the Proposed Transaction, the "adequacy of transportation" statutory factor deserves particular attention and must be read broadly. Transportation is defined in this context to include any "locomotive, car, vehicle, vessel, warehouse, wharf, pier, dock, yard, property, facility, instrumentality, or equipment of any kind related to the movement of passengers or property, or both, by rail," and, importantly, "services related to that movement."[35] The "adequacy of transportation to the public" statutory consideration is not confined to the efficiency of rail service, but also reaches questions of how the Proposed Transaction's rail and yard operations will impact transportation around those rail facilities and affect the public's own ability to move throughout the community.

The Board has previously considered the effects of increased traffic on grade crossings, emergency vehicle access, and pedestrian safety to be cognizable harms needing mitigation.[36] In the Canadian National Railway and EJ&E West Company ("CN–EJ&E") merger, the Board conditioned the merger upon implementation of grade separations, emergency response measures, and school and pedestrian safety programs.[37] Although CN–EJ&E was a minor transaction that did not require application of the mandatory section 11324(b) factors, and thus much of that community mobility-related relief was characterized as environmental mitigation, these conditions were imposed in the final merits order, confirming the Board's recognition of these community mobility harms and its practice of requiring mitigation of them. In the current transaction, these same mobility and safety harms also fall under the mandatory statutory consideration of the "adequacy of transportation to the public."[38] The mobility and safety impacts identified in this comment, *see infra* section V.A, thus bear upon the public interest determination in this proceeding.

To be sure, many of the public health and safety considerations discussed below will also be evaluated through the environmental review process conducted by the Board's Office of Environmental Analysis ("OEA"). Ensuring that any Board order approving a transaction protects these public interests and provides for the mitigation of any harms to them, however,

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[35] 49 U.S.C. § 10102(9).

[36] *Canadian Nat'l Ry. & Grand Trunk Corp.—Control—EJ&E W. Co. (Decision No. 16)*, FD 35087, slip op. at 3 (STB served Dec. 24, 2008) ("CN–EJE Decision No. 16").

[37] *Id.*

[38] 49 U.S.C. § 11324(b).

must be part of the Board's final decision on the merits of the Proposed Transaction. Indeed, that is precisely what the Board's regulations require.[39]

In this proceeding, the environmental review process has been adjusted significantly from past practice, changing how its steps will align with the overall merger review process and limiting the opportunity for communities to effectively engage in—or even review—OEA's analysis of local impacts prior to the publication of a final EIS. In prior proceedings, OEA published a draft EIS before the merits hearing, so affected communities could refine their positions and negotiate better defined mitigation measures that OEA could carry into the final EIS as recommended conditions.[40] Here, by contrast, the Board has waived the draft EIS comment period, and the deadline for merits comments and requests for conditions falls while the environmental review is still pending, impact information remains high-level, and the OEA's analyses are not yet available to inform comments.[41] Thus, raising public health and safety-related concerns in the merits comment is appropriate, and it may be necessary for SEI and other stakeholders to update their positions on environmental impacts of the proposed merger based on future steps in the OEA environmental review process and the Final EIS.

In any event, the procedural path through which comments are raised—through the OEA docket or overall merits comments—does not ultimately change the Board's obligation to weigh environmental harms in determining whether the transaction is "consistent with the public interest,"[42] and condition approval of the Proposed Transaction on their mitigation.

B. The Board should order mitigation of merger-related harms.

This subsection addresses the third and fourth components of the "consistent with the public interest"[43] statutory standard, which relate to weighing and mitigating localized harms of any approved transaction. Under the regulations, a merger "serve[s] the public interest only when substantial and demonstrable gains in important public benefits—such as improved service and

[39] 49 C.F.R. § 1180.1(f) ("[T]he Board must consider significant potential beneficial and adverse environmental impacts in deciding whether to approve a transaction as proposed, deny the proposal, or approve it with conditions, including appropriate environmental mitigation conditions addressing concerns raised by the parties.")

[40] *See Union Pac. Corp.—Control—Norfolk S. Corp. (Decision No. 21)*, FD 36873 et al., slip op. at 12 n.12 (STB served May 28, 2026) (noting that environmental concerns would be addressed in the environmental review proceeding before OEA); *id.* at 18 (observing that merits comments are a "limited opportunity, early in a proceeding" for parties to articulate their positions on the merger).

[41] *Compare with id.* at 39.

[42] 49 U.S.C § 11324(c).

[43] *Id.*

safety, enhanced competition, and greater economic efficiency—outweigh any anticompetitive effects, potential service disruptions, or other merger-related harms."[44]

The third key component in applying the Board's standard is mitigating transaction-related harms: "The Board will condition the approval of Class I combinations to mitigate or offset harm to the public interest."[45] Thus, the Board's public interest assessment is a balancing exercise, in which the Board weighs "the benefits of the merger" against the harms "that cannot be mitigated by conditions."[46] Because the balancing only weighs harms that cannot be mitigated, the Board's final order must first require mitigation of the harms wherever possible. Accordingly, the Board should "condition the approval of Class I combinations to mitigate or offset harm to the public interest," imposing conditions that are operationally feasible and proportionate to the harm addressed.[47]

When considering what harms must be mitigated and balancing the benefits and remaining harms of the Proposed Transaction, the Board should not overlook localized, community-concentrated harms in light of nationwide benefits. This is the fourth, final, and fundamental, component of the Board's standard: localized harms cannot be ignored even if they might be outweighed by overall benefits. The Board has noted that the revised 2001 rules "strengthened consideration of a merger's impacts on communities."[48] Systemwide and nationwide benefits of course remain the focus of the Board's ultimate public interest balancing, but a net gain (such as systemwide greenhouse gas emissions reductions) does not erase a concentrated increase in harm to a particular locality (such as increased particulate matter emissions due to localized traffic changes). Even if the Board endorses the Applicants' claims of systemwide or national net benefits, those benefits do not outweigh the transaction-related harms for the people of Englewood or similar communities across the country, and the applicable standard does not allow aggregate benefits to render local harms irrelevant.

Even in reviewing transactions under more lenient standards, the Board considered and required mitigation of localized impacts. In the CN–EJE merger approval, one Board member noted that "anticipated amelioration of . . . congestion is the only basis for the Final EIS's conclusion that there are benefits sufficient to offset the high environmental impacts expected for the communities along the existing EJE lines."[49] Although the Board ultimately approved that merger, it accounted for community-level impacts, even under the less intensive "minor merger" standard. As the Board member explained, the local harms needed to be both considered in the

[44] 49 C.F.R. § 1180.1(c).

[45] *Id.* § 1180.1(d).

[46] CP–KC Decision No. 35 at 18.

[47] 49 C.F.R § 1180.1(d).

[48] *Union Pac. Corp.—Control—Norfolk S. Corp. (Decision No. 21)*, FD 36873 et al., slip op. at 18 (STB served May 28, 2026).

[49] CN–EJE Decision No. 16 at 57 (Buttrey, commenting) (emphasis added).

public interest balancing and mitigated wherever possible.[50] This balancing and weighing of harms is now explicitly required under the heightened "major merger" public interest standard.

The Applicants' conduct in this proceeding further underscores the need for the Board to order clear, enforceable mitigation conditions in any final order that would approve the Proposed Transaction. In outlining the "Conditions to Mitigate and Offset Merger-Related Harms," a required component of the Application, the Applicants make no mention of any local community impacts—let alone propose mitigation.[51] A Board Member has already expressed concern that the Applicants have created "a lack of transparency and depth in the application," specifically because they have not offered "a very robust plan for how they will . . . mitigate potential harms."[52] That Board Member further observed that "the Applicants have approached this proceeding with an apparent strategy of 'letting the line out slowly.'"[53] This approach is precisely what the Board's revised "heightened standard" (described above) was implemented to prevent, as major merger applicants had a history of "over-promised and under-delivered" public benefit claims, and because the consequences of an erroneous approval can be severe and hard to remedy.[54]

The Applicants have been slow to put forth meaningful mitigation proposals during the application stage, which is particularly troubling given the way this matter has proceeded more generally. Applicants have provided information piecemeal over time—making the entire process less transparent, obscuring their underlying positions and key data, and necessitating extensions of the application phase. And Applicants' public statements outside of the proceeding, most notably the remarks of UP's Chief Executive Officer to shippers, suggest that the Board would need to be especially scrupulous in both crafting and overseeing implementation of conditions on merger approval necessary to assure the post-transaction entity treats all stakeholders fairly. The Applicants' conduct further suggests that it is not viable for the Board to rely heavily on voluntary mitigation agreements, as promoted in the regulations,[55] but rather must be more vigorous in encouraging discussion of and ultimately requiring adequate mitigation. Indeed, a Board Member has noted that its encouragement of "mutually-acceptable mitigation agreement with . . . impacted communit[ies]" is based on the understanding that "no one is in a better position to determine what mitigation measures are needed and appropriate than

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[50] *Id*.

[51] *See* Rev. Appl. 1-90–93.

[52] *Union Pac. Corp.—Control—Norfolk S. Corp. (Decision No. 37)*, FD 36873 et al., slip op. at 5 (STB served Sep. 18, 2026) (Kloster, concurring).

[53] *Id.*

[54] *See* Major Rail Consolidation Procedures, 5 S.T.B. 539, 560 (2001).

[55] *See* 49 C.F.R § 1180.1(f)(2) ("The Board encourages voluntary agreements of this nature because they can be extremely helpful and effective in addressing specific local and regional environmental and safety concerns, including the sharing of costs associated with mitigating merger-related environmental impacts.").

the affected community itself" and so the "Board should not presume to know better than the affected communities what mitigation will be required in the public interest."[56] Accordingly, the Board should take an active part in identifying—based on community input like these comments from SEI—and ordering the conditions that the public interest requires, taking particular care to make clear, enforceable conditions with continued Board oversight, rather than merely deferring to the few measures the Applicants elect to offer.

The public interest standard therefore does more than permit the Board to consider the environmental, public health, and public safety harms that the Proposed Transaction will create in Englewood. It compels the Board to weigh those harms, to impose binding conditions on any merger approval that will mitigate the local harms that can be mitigated by condition, and to count those it cannot against the benefits of the Proposed Transaction.

And it is the Applicants that bear the burden to establish that the Proposed Transaction is consistent with the public interest under that standard.[57] The Application makes a thin showing with respect to the proposed public safety and environmental benefits that may result from the proposed merger.[58] SEI takes no position on balancing public interest benefits and harms at the national level, but instead addresses how the Applicants have overlooked concrete, foreseeable harms that the Proposed Transaction will cause in Englewood. These are harms the Board must weigh and condition approval upon mitigating before it can find the public interest standard met.

IV. The Proposed Transaction Will Cause Truck, Rail, and Shipping Activity to Spike, with Significant Impacts for Englewood.

Applicants state that Chicago is one of four locations nationwide where this merger will be the most "consequential," given that Chicago is a "central interchange gateway" for the UP and NS systems.[59] The merger will be especially consequential for Englewood, home to NS's busiest intermodal terminal, the 47th Street Yard.[60] The limited picture that the amended Application provides regarding operational changes and plans reveals that traffic and shipping activity at the 47th Street Yard will surge. The following section describes some of these

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[56] CN–EJE Decision No. 16 at 57 (Buttrey, commenting); *see also* CP–KC Decision No. 35 at 154 (noting that the Board encourages applicants to enter into "agreements with potentially affected communities . . . to address local concerns").

[57] 49 C.F.R. § 1180.4(c)(8); *id.* § 1180.6(a)(2)(iv).

[58] *See* Rev. Appl. 1-49 (describing the anticipated safety and environmental benefits expected to result from the Proposed Transaction).

[59] Rev. Appl. 1-13.

[60] *See* Rev. Appl. 2-707, Verified Statement ("V.S.") of Gehringer & Orr 97; Joe Barrett, *Norfolk Southern Rail-Yard Plan Wins Key Vote as Chicago Tries to Expand Cargo Hub*, Wall Street Journal (Feb. 1, 2023), https://www.wsj.com/articles/norfolk-southern-rail-yard-plan-faces-key-vote-as-chicago-tries-to-expand-cargo-hub-11675231411 ("Norfolk Southern's 47th Street Intermodal Facility [is] the largest such facility in its system . . . .").

changes, based on Applicants' plans, projections, and independent analyses by Northwestern University researchers.

Applicants' own projections show the merger will cause train traffic to spike in Englewood. In response to information requests from OEA, the Applicants reported that they anticipate over a dozen more trains per day, including hazardous material carloads, on track segments that run through Englewood and 47th Street Yard.[61] Applicants also disclosed that the trains they deploy on these tracks will be longer; on one segment that runs from Englewood to Indiana (10058 Chicago Line), for example, the average length will increase by ~1,000 feet (from ~7,000 feet pre-merger to ~8,000 feet post-merger), and the maximum train length will rise from ~8,000 feet to ~9,000 feet.[62] Applicants' estimate of the merger-related increase in shipping volume on the Englewood segments ranges from an additional ~13 million gross ton miles (GTM) annually[63] or a 100% increase[64] on one segment to an additional ~406 million GTM[65] or a 28.30% increase on another.[66]

These rail traffic estimates, while significant on their face, provide a limited picture of how rail traffic in Englewood specifically will change, given that shipping volumes reported to OEA are an average on segments of varying lengths—ranging from ~384 miles to ~0.1.[67] To develop a better understanding of how train traffic would increase in Englewood, Northwestern University researchers independently modeled changes by isolating the stretches of track that pass through Englewood, as described in **Attachment A**.[68] This modeling accounted for Applicants' planned consolidation of intermodal activity at the four UP and NS intermodal yards in Chicago: specifically consolidation of the NS 63rd Street Yard, which is adjacent to Englewood, into UP's Global 2 , and consolidation of UP Yard Center into NS 47th Street Yard.

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[61] *Master Data Tables for IR-3 September 2026.xlsx*, Comment ID EI-34308 to EI-34310, FD 36873 et al., Tab "Rail Line Segments," Segments 10058, 12307, 12755 (pdf filed September 9, 2026) ("IR-3 Data Table").

[62] *Master Data Tables for IR-4.xlsx*, Comment ID EI-34413 to EI-34420, FD 36873 et al., Tab "Locomotives, Consists & Track," Segment 10058 (pdf filed September 25, 2026) ("IR-4 Data Table").

[63] Master Data Table IR-3 "Rail Line Segments," Cell X640 (transaction growth mGTMs for segment 12755).

[64] IR-3 Data Table, "Rail Line Segments," Cell Z640 (% transaction mGTMs change for segment 12755).

[65] IR-3 Data Table, "Rail Line Segments," Cell X1041 (transaction growth mGTMs for segment 10058).

[66] IR-3 Data Table, "Rail Line Segments," Cell X1041 (% transaction mGTMs change for segment 10058).

[67] IR-3 Data Table, "Rail Line Segments," Column F (segment distance).

[68] Memorandum from Sam Dulin et al. to Counsel for SEI, *Re: STB Docket No. 36873: Rail Traffic Near Englewood After the UP-NS Merger*, at 1 (Nov. 18, 2026) ("Att. A").

The post-merger modeling also included a projected 6.6% growth in traffic systemwide from 2025 to 2030, and an estimated 2.2% truck-to-rail diversion.[69] The resulting forecast, represented in **Figure 1** below, was an estimated 43.7% merger-related increase in rail ton-miles in Englewood.[70]

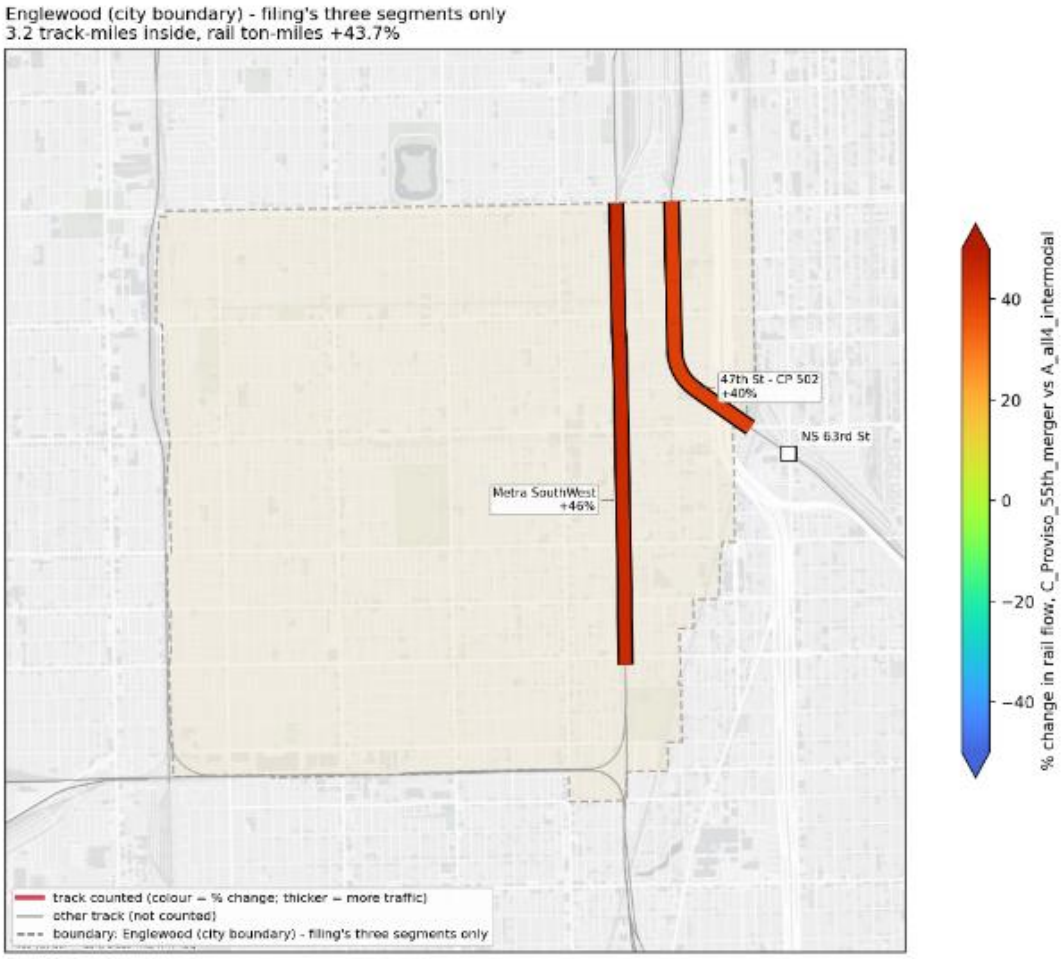

Figure 1. *Modeled post-merger traffic flow changes in segments of track in the Englewood community boundary, as defined by the City of Chicago; color represents post-merger change in traffic, with warm colors representing increase and cooler colors representing decreases.*

Increasing rail activity post-merger also means an increase in yard activity after the merger. Applicants project a post-merger boom in activity at the 47th Street Yard—a facility that operates 24 hours per day, 7 days per week, and 365 days a year.[71] Specifically, the Operating

[69] *Id.*; *see also* Rev. Appl. 2-708, V.S. Gehringer & Orr 98.

[70] Att. A, Dulin et al., at 1.

[71] IR-4 Data Table, Tab "Intermodal and Auto Ramps (A4)," Yard Code CS517_NS.

Plan states Applicants will redirect UP's Yard Center operations to 47th Street Yard, adding 195 lifts per day to the 1,269 lifts per day the latter already handles.[72] Furthermore, accounting for three years of merger-related growth, Applicants predict a 30% increase at 47th Street Yard from current conditions to 1,646 lifts per day.[73]

Corresponding with the surge in train and yard activity, Applicants also anticipate an increase in truck traffic at 47th Street Yard. In response to information requests from OEA, Applicants have disclosed that with the merger, truck traffic at the 47th Street Yard will jump from 676 trucks per day to 958 trucks per day post-merger, or a 40% increase.[74] These trucks will run through dense urban neighborhoods with schools, homes, churches, and pedestrian traffic. Applicants have not provided information necessary to fully assess the magnitude and scope of impact on sensitive locations such as these. SEI did not find any truck routing data or plans in the Amended Application or supporting materials and in response to SEI's requests for such truck trip information for the 47th Street Yard, NS's busiest intermodal yard, Applicants did not timely produce any such analyses.[75]

In sum, while the Applicants may be correct in their assertion that the merger could decrease truck traffic nationwide, the record shows that the opposite is true for Englewood. The truck traffic diversion and other purposed benefits of the Proposed Transaction that Applicants tout will come at the cost of localized harms to Englewood and communities like it across the country that will be grappling with a boom in truck, train, and shipping activity. As discussed below, Applicants have made no effort to consider these, let alone propose mitigation for localized harms to these communities.

V. Public Interest Harms of the Proposed Transaction in Englewood and Corresponding Requests for Mitigation

Rail and truck traffic will increase dramatically in Englewood as a result of the Proposed Transaction, resulting in significant negative impacts on local transportation and access to community resources; noise, vibration, light, and heat concerns; air quality deterioration; hazardous material risks; and land and water contamination. Each is a public interest consideration that the Board must weigh and mitigate, as addressed in this section.

And as to each category of impact on Englewood, SEI requests that the Board order specific mitigating conditions in any final order approving the Proposed Transaction. While the mitigation requests below respond to specific public interest harms that the merger would impose

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[72] Rev. Appl. 2-707, V.S. Gehringer & Orr 97.

[73] Rev. Appl. 2-742, V.S. Gehringer & Orr 132.

[74] IR-4 Data Table, Tab "Intermodal and Auto Ramps (A4)," Yard Code CS517_NS.

[75] As discussed in *supra* note 3, NS did provide some of this information on the eve of the comment deadline. Given that timing, neither SEI nor the Northwestern University researchers have had any opportunity to assess it.

on Englewood, many could be best implemented through a Board condition establishing a general community-directed mitigation fund. Because so many of the negative impacts of the Proposed Transaction on Englewood are driven by increased intermodal activity at the 47th Street Yard, a primary funding mechanism for this "Community Mitigation Fund" should be a fee imposed on each truck exiting or entering the yard. Applicants would pay into a dedicated community benefits fund that would then be administered with direction or meaningful input from Englewood residents to fund specific community projects and residential programs responsive to the community's actual priorities and needs related to merger impacts. Such a fund may offer a global mechanism for addressing many of the specific types of local harms detailed below.

The Board should also include a condition related to the future disposition of yards that Applicants project as being idled or otherwise having operations consolidated into other locations. Specifically, Applicants would cease activity at both the 63rd Street Yard and Yard Center facilities in Chicago under the Optimized Plan, consolidating current activities at those locations to other sites.[76] What happens to these yards in the wake of that consolidation will have massive implications for the nearby Chicago southside neighborhoods, including Englewood, particularly if those sites are redeveloped for data centers, energy infrastructure, or other uses that will create significant local infrastructure challenges. As such, the Board should include a condition that requires coordination with state and local government entities, including working through the City's Planned Development process, as well as direct engagement with community representatives before any sale or redevelopment of those properties.

A. Local Accessibility, Mobility, and Transportation Impacts

1. The Proposed Transaction's impacts on community accessibility and mobility are public interest harms that the Board must address.

As established above, the Proposed Transaction will create substantially more rail and truck traffic in Englewood and at the 47th Street Yard, affecting residents' ability to move—and move safely—through their own community. These impacts are harms that the Board must weigh and mitigate. Indeed, the "adequacy of transportation to the public" is a statutory factor that the Board must address in its public interest assessment.[77] Furthermore, the anticipated merger-related traffic surge in Englewood raises public safety concerns, and the Board's charge includes assuring that rail systems operate "without detriment to the public health and safety."[78]

The public transportation impacts that will result from merger-related increases in truck and train traffic in Englewood—longer and more frequent crossing closures, forced detours,

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[76] Rev. Appl. 2-708; *see also id.* at 707, Table 5 (showing lifts at Yard Center and 63rd Street Yard being reduced to "0" under the Optimized Plan).

[77] 49 U.S.C. § 11324(b)(1); *see also supra* section III, **Error! Reference source not found.**.

[78] 49 U.S.C. § 10101(8); *see also supra* section III, **Error! Reference source not found.**.

degraded walkability and connectivity, and temporary isolation of blocks during blockages—are public safety considerations that directly affect the "adequacy of transportation to the public."[79] As part of their application, the Applicants must demonstrate that the Proposed Transaction's effect on the adequacy of transportation to the public is consistent with the public interest.[80] But they have not assessed the transaction's effect on mobility or accessibility in Englewood at all.[81]

Accessibility[82] and mobility,[83] as used in these comments, collectively refer to residents' practical ability to move within and around their neighborhood—reaching jobs, schools, medical care, and emergency services—without the delay, danger, or isolation that more frequent and longer train and truck movements impose. Accessibility and mobility are of significant importance in Englewood given the high share of residents with mobility challenges: residents there are twice as likely to be disabled or experience ambulatory difficulty than residents of Chicago as a whole.[84] The application materials and independent expert analysis described below reveal that there are anticipated transportation and safety impacts in Englewood that can be mitigated.

Although accessibility and mobility are key transportation concerns, UP has "admit[ted] that, after conducting a reasonable search, it has not identified nonprivileged estimates, analyses, or studies conducted in connection with the Merger specifically concerning the impact of the Merger on" traffic on local roadways near the 47th Street Yard,[85] access to healthcare,[86] access to public transit,[87] or access to community and educational facilities for people who live near the Yard.[88] Union Pacific has further admitted that it has not identified any analyses on impacts to general neighborhood connectivity in Englewood as a result of the Proposed Transaction,[89] nor

[79] 49 U.S.C. § 11324(b)(1).

[80] 49 C.F.R. § 1180.6(a)(2)(iv).

[81] *See generally* Union Pacific's Resps. and Objs. to SEI's 2d Set of Disc. Reqs., *Union Pac. Corp.—Control—Norfolk S. Corp.,* FD 36873 (Nov. 13, 2026) ("UP Resps. to SEI 2d Set").

[82] Accessibility refers to the ability to reach destinations or services such as schools or medical care.

[83] Mobility refers to movement, including speed, distance and ease of movement.

[84] *Chicago Health Atlas: Englewood*, *supra* note 14 (disability and ambulatory-difficulty measures).

[85] UP Resps. to SEI 2d Set, *supra* note 81, Resp. to No. 8.

[86] *Id.*, Resp. to No. 11.

[87] *Id.*, Resp. to No. 12.

[88] *Id.*, Resp. to No. 13.

[89] *Id.*, Resp. to No. 14.

has it studied the impact of the Proposed Transaction on vulnerable populations, such as children or older adults, near the Yard.[90]

a. Crash and Collision Risk

The Proposed Transaction will increase the volume of heavy-duty and freight-related traffic on the local roads serving the consolidated 47th Street Yard. Englewood already experiences traffic and accident fatality rates that are double or nearly triple the city's averages.[91] The City of Chicago's Vision Zero plan likewise designated Englewood as one of eight "High Crash Areas" and found that residents of high-economic-hardship areas, like Englewood, are three times as likely to die in a traffic crash as low-economic-hardship areas.[92]

Analysis by Northwestern University researchers, detailed in **Attachment B**, confirms that Englewood already bears a disproportionate injury burden from truck and freight crashes and explains how merger-related traffic increases will add to these safety and traffic burdens. Currently, the community experiences nearly two times more heavy-duty-vehicle ("HDV") crashes per square mile per year compared to the rest of Chicago,[93] and each crash in Englewood causes roughly twice as many injuries compared to elsewhere in Chicago, with the rate of fatal and incapacitating injuries nearly double as well.[94] That elevated risk is likely linked to proximity to the 47th Street Yard, as "a crash within [one] mile of a major UP or NS yard has 1.44 times the odds of involving an HDV" as other parts of the City.[95] Furthermore, this expert

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[90] *Id.*, Resp. to No. 15 (admitting that "after conducting a reasonable search, it has not identified nonprivileged estimates, analyses, or studies conducted in connection with the Merger specifically concerning the impact of the Merger on vulnerable populations (e.g. households without vehicles, transit-dependent populations, older adults, children under six years of age, persons with disabilities, persons with respiratory or cardiovascular health conditions) near the 47th Street Yard.").

[91] *Id*. (traffic fatality and motor vehicle crash mortality rates).

[92] City of Chicago, *Vision Zero Chicago Action Plan 2017–2019*, at 17, 30–31 (June 2017), https://www.chicago.gov/city/en/sites/complete-streets-chicago/home/traffic-safety.html #docaccess-26ed68918ff7dd823c58019c2b48c15528cd8b24896e99880656f63425074ed7.

[93] Memorandum from Northwestern University McCormick School of Engineering's Mobility and Behavior Lab to Counsel for SEI, Re: STB Docket No. 36873: *Englewood/47th Street Yard Truck and Freight-Related Crash Analyses*, at 1 (Nov. 18, 2026) ("Att. B") (finding that Englewood experiences 5.6 injuries in HDV crashes compared to 3.4 citywide).

[94] *Id.* at 8–9 (finding that there are 25.3 injuries per 100 truck crashes in Englewood, compared to 12.3 elsewhere in Chicago, and fatal and incapacitating injuries "see a similar near-doubling" with 2.1 per 100 crashes in Englewood compared to 1.1 elsewhere in Chicago).

[95] *Id.* at 10.

analysis found that seven of the eight community areas identified as having the highest truck crash injury rates "are categorized as being primarily near UP/NS yards."[96]

Northwestern University researchers also identified a secondary collision risk stemming from HDV- and freight-related collisions that involve low-clearance viaducts. In Englewood, 11.5% of HDV crashes were likely so-called "clearance" strikes, compared to only 1.8% elsewhere.[97] Low-clearance structure collisions create safety and congestion hazards beyond the damage to the structure itself.[98]

Against this baseline, Northwestern University researchers modeled the marginal effects of traffic increases that will result from the Proposed Transaction. Comparing Year 5 scenarios both with and without the Proposed Transaction reveals that the Proposed Transaction would increase both the number of freight-related crashes and injuries from those crashes by roughly 22%.[99] Importantly, "[t]hese estimates likely understate the full effect on Englewood" because they "do not include additional clearance strikes from more trucks traveling among the neighborhood's low viaducts, crashes on the Dan Ryan Expressway, or any shift in which streets the additional trucks use, all of which would add to present congestion experienced by Englewood residents."[100]

In the CP–KC transaction, the OEA stated that the transaction "could affect traffic on roadways" because "increasing operational activities at certain intermodal facilities . . . would increase the number of trucks traveling on the local roads that provide access to those intermodal facilities."[101] The Board ultimately found that there would be no adverse impacts as a result of this traffic, but this conclusion was based on the assumption that "the existing capacity of local roads serving intermodal facilities" was sufficient to withstand the increased traffic.[102]

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[96] *Id.* at 11.

[97] *Id.* at 7.

[98] *Id.*; *see also* Anil K. Agrawal, *Strikes on Low Clearance Bridges by Over-Height Trucks in New York State*, U.S. Dep't of Transp. UTC Spotlight (Jan. 2013); Bao Nguyen & Ioannis Brilakis, *Understanding the Problem of Bridge and Tunnel Strikes Caused by Over-Height Vehicles*, 14 Transp. Res. Procedia 3915 (2016).

[99] Att. B, McCormick School Memo, at 13 (finding that "[i]n Englewood, the merger would raise freight-related crashes from 27.6 to 33.6 per year," a 22% increase relative to Year 5 without the merger, and injuries in freight-related crashes due to the proposed merger will increase from 6.6 to 8.1 per year, also a 22% increase).

[100] *Id.*

[101] *Canadian Pac. Ry.—Control—Kan. City S.*, Final EIS at S-14, FD 36500 (STB OEA Jan. 27, 2023).

[102] *Id.* at S-15.

The Board cannot make that assumption in this case. The site-specific analysis attached to these Comments shows that Englewood's local roads already lack sufficient capacity to safely handle current intramodal truck activity, let alone absorb safely the added traffic that the Proposed Transaction will indisputably bring. While the Board's finding of no adverse impacts in the CP–KC transaction relied on the "existing capacity of local roads serving intermodal facilities" to carry an increased volume of trucks,[103] capacity to absorb traffic is not the same as capacity to absorb traffic without increasing collisions. On local roads in Englewood near and serving intermodal facilities, including the 47th Street Yard, the analysis provided here identifies existing "freight-related crash hotspots" at locations across Englewood, including beside the 47th Street Yard and along the neighborhood's interior corridors,[104] and shows the Proposed Transaction will concentrate additional collisions in a community already experiencing this harm.[105]

The Board is charged with ensuring safe public transportation and has previously acknowledged increased traffic as an impact worth evaluating. This Comment provides technical analysis indicating that this impact will be adverse, and Applicants have conducted no site-specific analysis of these issues. Thus, the Board must treat the resulting collision and congestion risk as a cognizable public-interest harm, condition any approval of the Proposed Transaction on the mitigation measures set out below, and weigh any residual risk that cannot be mitigated in its public-interest balancing.

b. Grade Crossings: Delay and Blockages

The Proposed Transaction's increased rail and yard activity will impact three at-grade crossings in Englewood, according to the Applicants' Master Segment Data Tables. Applicants identified these crossings because the increase in rail activity due to the Proposed Transaction exceeds the threshold that the Board uses to decide which locations require further review.[106] The Applicants' own data therefore indicates that the transaction's impacts will be significant enough to warrant additional study. In prior decisions, the Board studied each individual crossing, rather than focusing on systemwide averages, and imposed mitigation at every crossing that would be "substantially affected."[107] These three crossings warrant the same individualized inquiry.

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[103] *Id.*

[104] Att. B, McCormick School Memo, at 2 (describing locations near yards where local roads are impacted by an increased volume of freight-related crashes); *see also id.* at 6 (Fig. 6).

[105] *Id.* at 11 (noting that "West Englewood and Englewood rank very highly in injury rates from truck crashes").

[106] 49 C.F.R. § 1105.7(e)(5) (for a rail line, roughly an increase of eight trains per day or 100% in gross ton-miles; for a yard, a doubling of carloads).

[107] CN–EJE Decision No. 16 at 42–46.

More frequent blockages at Englewood's at-grade crossings will delay residents' ability to move within their own community and threaten the responsiveness of emergency services such as fire, police, and medical response. The Board has recognized this general safety concern in a prior proceeding, noting that "because average rail traffic would increase, the frequency with which emergency vehicles would be delayed by trains would likely increase."[108] In the same decision, the Board acknowledged that extended delays at certain crossings had "the potential to completely isolate residence, businesses, or other buildings" where no alternate access existed.[109]

Even where impacts to a crossing do not surpass the Board's mandatory mitigation thresholds, the Board has recognized the need for grade-crossing mitigation and has required applicants to implement it. In the CN–EJE transaction, although only a few grade crossings triggered mitigation by exceeding mandatory mitigation thresholds, the Board nonetheless required applicants to work with local communities to support their efforts to secure grade separations where appropriate and contribute funding for the separations.[110] Similarly, the Board's final CP–KC decision noted that although there were no grade crossings that would require mitigation based on established standards, the applicants had an obligation to "work with potentially affected communities in support of securing funding, in conjunction with appropriate state agencies, for crossing mitigation projects where they may be appropriate."[111] Although only three grade crossings have been identified in the greater Englewood area as exceeding the mandatory review threshold,[112] other grade crossings in the community may similarly benefit from such review and mitigation.

c. Pedestrian and Bicycle Safety

More frequent and longer trains, coupled with increased truck traffic due to the diversion caused by the Proposed Transaction, will increase dangers to pedestrians and cyclists. This is a particularly acute threat given the aging population in Englewood and the proximity of both the yard and rail corridor to schools and parks.[113] The 47th Street Yard is adjacent to Fuller Park, the Canaryville Little League fields, the Eden Place Nature Center, Lowe Park, Malus Park, Tilden

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[108] *Canadian Pac. Ry.—Control—Kan. City S.*, Final EIS, FD 36500, at S-13–S14 (STB OEA Jan. 2023).

[109] *Id.* at S-14.

[110] CN–EJE Decision No. 16 at 62–63.

[111] CP–KC Decision No. 35 at 201.

[112] *See* IR-3 Data Table, Tab "Roadway&AtGradeCrossings(G1)," Segments 10058, 12755, 12305.

[113] *See* Chicago Metro. Agency for Planning, *Englewood Community Data Snapshot* at 3 (June 2026), https://www.cmap.illinois.gov/wp-content/uploads/dlm_uploads/Englewood.pdf (showing that nearly 40% of Englewood's population is age 50 and over based on 2020–2024 data); *Chicago Health Atlas: Englewood*, *supra* note 14 (disability measures in Englewood).

High School, and the Dewey Elementary Academy of Fine Arts.[114] In the CN–EJE transaction, the Board explicitly acknowledged that "the safety of school children and pedestrians, as well as school bus delay, are important issues" and imposed mitigation conditions to address those transaction-related concerns.[115] Here, the projected 22% increase in freight-related crashes noted above translates into greater collision exposure for pedestrians and cyclists, who are the road users most vulnerable to severe injury in a collision.[116]

Given that these harms have warranted mitigation conditions in past transactions approved under less demanding standards, they warrant the Board's attention here, where a merger-related boom in rail and truck activity will directly affect transportation safety in Englewood.

2. The Board should order mitigation to address accessibility, mobility, and local transportation impacts.

The accessibility and mobility harms created by the Proposed Transaction in Englewood should be mitigated through Board-ordered conditions in any order approving the Application. To the extent these harms cannot be mitigated, the Board must count them as residual harms in its public interest balancing.[117] In prior decisions, the Board imposed accessibility and mobility conditions analogous to those requested here, confirming that the measures below are operationally feasible and within the Board's power to impose. The heightened standard governing this proceeding provides even stronger grounds for imposing them here.

Therefore, SEI asks the Board to condition any approval of this Proposed Transaction on Applicants implementing the following accessibility and mobility measures:

- **Blocked crossing alerts.** Install and fund a predictive blocked-crossing notification system that delivers advanced notice of blocked grade crossings to residents and to police, fire, and rescue services.

- **Public awareness.** Conduct a media campaign throughout the affected counties and communities surrounding the rail lines advising the public of the increased operations along the rail line.[118]

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[114] Google Maps, https://www.google.com/maps/@41.8047242,-87.6342459,15.19z (last visited Nov. 16, 2026) (showing the proximity of the 47th Street Yard and rail corridor to schools, community facilities, and parks).

[115] CN–EJE Decision No. 16 at 48–49.

[116] *See* Brian C. Tefft, *Impact Speed and a Pedestrian's Risk of Severe Injury or Death*, 50 Accident Analysis & Prevention 871 (2013).

[117] *See supra* section III, **Error! Reference source not found.**.

[118] *See* CN–EJE Decision No. 16 at 59 (Voluntary Mitigation ["VM"] 2).

- **Corridor safety review.** Coordinate with the Illinois Department of Transportation, Chicago Metropolitan Agency for Planning, Chicago Department of Transportation, and other appropriate local agencies to review rail corridors' impacts on pedestrian and vehicle safety, identify remedies, and commit to implementing them.[119]

- **Crossing signage and notifications.** Provide and maintain permanent signs prominently displaying both a toll-free telephone number and a unique grade-crossing identification number in compliance with Federal Highway Regulations (23 C.F.R. Part 655) at each of the grade crossings in Englewood. The toll-free number should enable drivers to report accidents, malfunctioning warning devices, stalled vehicles, or other dangerous conditions and should be answered 24 hours per day by Applicants' personnel.[120]

- **Protective fencing.** Provide fencing where schools or parks are within one quarter of a mile of the right of way and to identify at-grade crossings where additional pedestrian warning devices may be warranted.[121]

- **School safety outreach**. Identify elementary, middle, and high schools within a half mile of Applicants' right of way and provide the schools, upon request, with funding for crossing guards, safety-related upgrades (such as cross-walk signals, signage or painting), and informational materials concerning railroad safety.[122]

- **Truck routing plans.** Develop and implement a truck-routing plan that directs merger-related truck traffic away from schools, parks, residential areas, and low-clearance viaducts in a manner that will minimize truck traffic that creates safety hazards.

- **Reduce crossing blockages.** Examine train operations for ways to reduce crossing blockages and implement the identified measures.[123]

- **Crossing blockage limits.** Operate under U.S. Operating Rule No. 526 (Public Crossings), which provides that a public crossing must not be blocked for longer than 10 minutes unless it cannot be avoided and that, if possible, rail cars, engines, and rail equipment may not stand closer than 200 feet from a highway/rail at-grade crossing when there is an adjacent track.[124] Repeated violations of this condition should result in a train

[119] *See id.* at 59–60 (VM 7).

[120] *See id.* at 60 (VM 9).

[121] *See id.* (VM 10).

[122] *See id.* (VM 11).

[123] *See id.* at 63 (VM 29).

[124] *See id.* (VM 35).

length restriction and financial penalty paid into the Community Mitigation Fund, to ensure crossing blockage restrictions are not routinely exceeded.

- **Delay reporting.** Develop and submit a report to the Board on the frequency and duration of train delays at crossings for the duration of the oversight period,[125] including any impacts to vehicle congestion at the crossing during the delay.

- **Emergency services coordination.** Coordinate with the City of Chicago and Englewood community to minimize emergency vehicle delay by maintaining facilities for emergency communication with local emergency response centers through a dedicated toll-free telephone number; and providing, upon request, dispatching monitors that allow emergency dispatching personnel to see real-time train locations.[126]

- **Operation Lifesaver program.** Make Operation Lifesaver programs available to communities, schools, and other appropriate organizations located along the rail line for at least the duration of the oversight period after the effective date of the Board's final decision.[127]

- **Monitoring crossings.** Consult with all appropriate agencies to implement a CCTV system with video cameras placed in locations so that the movement of trains can reasonably be predicted at grade crossings. The necessary equipment, including cameras, monitors, poles, cables, controllers, cabinets, communications equipment, electrical connections, or other necessary components, the installation of the equipment, and equipment training should be paid for by the Applicants.[128]

To the extent that these conditions cannot fully eliminate the accessibility and mobility-related harms created by the Proposed Transaction, the Board must consider the residual harms in its public interest balancing.

B. Noise, Vibration, Light, and Heat

1. Merger-related activity will bring noise, vibration, light, and heat-related harms to Englewood, which are public interest considerations that the Board must address.

The Proposed Transaction will increase operational noise, ground vibration, heat island effects, and light-related harms in Englewood. This section proceeds in two parts: it first shows that the Proposed Transaction's noise, vibration, heat island, and lighting impacts are public-

[125] *See id.* (VM 36).

[126] *See id.* at 64–65 (VM 42); *see also* CP–KC Decision No. 35 at 202 (VM-Grade Crossing-06).

[127] *See* CN–EJE Decision No. 16 at 75.

[128] *See id.* at 77.

interest harms that the Board must weigh, and then identifies mitigation requirements that the Board should impose if it approves the Proposed Transaction.

Rail operations and yard activity generate noise pollution, light pollution, ground vibrations, and localized heat.[129] The Board has repeatedly recognized these impacts to be harms that must be mitigated and warrant conditions.[130] As explained above, the Applicants' own projections show a substantial increase in rail and yard activity at the 47th Street Yard.[131] Given that increased rail operations and yard activity generate the noise, light, heat, and vibration-related harms identified below—and in the absence of any evidence suggesting such impacts will not increase in proportion to merger-related freight activity—the Board can only conclude that these types of harm will increase in Englewood as a result of the Proposed Transaction.

a. Noise and Vibration

This Proposed Transaction will subject Englewood to substantially more rail-related noise and ground vibration, public interest harms that the Board must consider. As the mechanism for these two harms is the same—increased traffic—the Board and this comment assess them together. Operational noise consists of horns, braking, and wheel squeal, as well as yard operations.[132] The projected increases in both yard operations—a 30% increase in daily lifts under the Growth Plan[133]—and increase in rail and truck traffic[134] will intensify each of these noise and vibration sources in Englewood. Additionally, the Application presumes completion of the 47th Street Yard expansion currently underway as part of the NS capital improvement plan, which means Englewood will experience associated construction-related noise and vibration impacts during the period of merger-related operational integration.

Merger-related increased noise is a public health hazard that the Board must weigh in light of the Rail Transportation Policy mandate "to operate transportation facilities and equipment without detriment to the public health and safety."[135] Noise has been recognized as a

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[129] *See generally* U.S. Dep't of Transp., Fed. Transit Admin., *Transit Noise and Vibration Impact Assessment Manual*, FTA Report No. 0123 (Sep. 2018).

[130] *See* CN–EJE Decision No. 16 at 33–34 (stating that the transaction imposes "substantial environmental costs on the local communities along the EJ&E line in the form of . . . increased noise and vibration"); CP–KC Decision No. 35 at 156 (stating that increased train frequency "could result in adverse noise impacts at some locations").

[131] *See supra* section IV.

[132] *See* CN–EJE Decision No. 16 at 49 (imposing wheel-squeal and construction-related noise mitigation); *id.* at 39 n.85 (explaining the use of quiet zones as mitigation for horn noise).

[133] *See* Rev. Appl. 2-742, Gehringer & Orr V.S. at 132 (Table 8);

[134] *See supra* section III.

[135] 49 U.S.C. § 10101(8).

"public health hazard" since at least 1968.[136] Chronic exposure to environmental noise, even at low levels, can cause "sleep disruption, and stress that contribute to cardiovascular disease, cerebrovascular disease, metabolic disturbances, exacerbation of psychological disorders, and premature mortality" and "interferes with cognition and learning, contributes to behavior problems, and reduces achievement and productivity . . . with children among the most vulnerable."[137] As noted above, Englewood residents are specifically vulnerable to these sorts of health impacts, and children at the nearby schools will be among those most exposed to increased activity at the 47th Street Yard.[138] The Board must weigh the transaction's added noise atop of that cumulative burden because the merger-related noise will not occur in isolation; it will impact the specific people and schools around the 47th Street Yard.

In the CP–KC transaction, the Board found that "even with mitigation, train noise associated with increased rail traffic resulting from the Transaction will result in adverse impacts on residences and other locations that are sensitive to noise."[139] The Board reached this conclusion under the weaker, pre-2001 public interest standard. It imposed noise-related mitigation measures to address those harms to the extent possible and weighed the residual noise-related harms in its public interest balancing, ultimately finding the CP–KC transaction to be consistent with the public interest. Under the heightened public interest standard that governs this proceeding, the Board must similarly engage with comparable noise-related impacts in Englewood.

While Englewood already experiences intermittent train noise, as in the CP–KC transaction, "the projected increase in rail traffic from the Transaction will make rail-related noises more frequent."[140] Furthermore, the rail traffic increase that is projected for Englewood is significant under the Board's own method of analysis. In CP–KC, the Board verified this direct relationship between freight traffic and noise impacts by measuring, through the environmental review process, rail-noise emissions in the field and then modeling day-night noise levels segment by segment.[141] The Board analyzed railyard and intermodal noise separately through modeling, rather than monitoring, and as a function of the number of lifts performed each day, the volume of truck traffic, the number of railcars processed, and the yard's hours of

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[136] Am. Pub. Health Ass'n, *Noise as a Public Health Hazard*, Policy No. 202115 (Oct. 25, 2021), https://www.apha.org/policy-and-advocacy/public-health-policy-briefs/policy-database/2022/01/07/noise-as-a-public-health-hazard.

[137] *Id*.

[138] *See supra* section II.

[139] CP–KC Decision No. 35 at 157.

[140] *Id.* at 166.

[141] *Canadian Pac. Ry.—Control—Kan. City S.*, Final EIS, FD 36500, at 3.6-11 (STB OEA Jan. 2023).

operation.[142] Thus, in this proceeding, the Board should likewise model railyard and intermodal noise based on projected increases in yard and truck activity from the Proposed Transaction.

The same increase in rail and yard activity that amplifies noise harms carries a second, distinct harm into the neighborhood in the form of ground vibration. Increased ground vibrations in the areas surrounding the yard, including residential homes directly to the west of the 47th Street Yard, threaten to cause structural and foundation damage,[143] an issue the Applicants have not addressed at all. The Board recognizes ground-borne vibrations as a cognizable annoyance impact that intensifies as train frequency increases.[144]

Vibration from the increased activity identified above harms Englewood residents and their homes. According to a 2024 study, "[t]rain-induced ground-borne vibrations have attracted attention because they can damage buildings and cause residents discomfort."[145] Ground vibrations, such as those caused by rail activity, can also cause lead, a potent neurotoxin, to be released into residential drinking water by disturbing aging lead service lines.[146] Stated simply, inert lead in the coating of drinking water pipes is literally shaken off the interior walls of the pipe by rail vibrations, and then becomes particles in the water flowing into people's homes. Englewood is among the Chicago neighborhoods with the most extensive lead service lines, making this risk particularly salient here.[147] And the children pay the price, with rates of childhood lead poisoning in Englewood triple that of the City more broadly.[148] This is a direct public health and safety concern given that both the EPA and CDC recognize that there is no known safe level of lead exposure in children.[149]

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[142] *See id.*

[143] Mohsen Seyedi, *Impact of Train-Induced Vibrations on Residents' Comfort and Structural Damages in Buildings*, 12 J. Vibration Eng'g Tech. S1961 (2024), https://doi.org/10.1007/s42417-024-01513-x.

[144] *See Canadian Pac. Ry.—Control—Kan. City S.*, Final EIS, at § 3.6.1.2, FD 36500 (STB OEA Jan. 2023).

[145] Seyedi, *supra* note 143.

[146] U.S. EPA, *Basic Information About Lead in Drinking Water* (June 18, 2026), https://www.epa.gov/ground-water-and-drinking-water/basic-information-about-lead-drinking-water ("Ground tremors from construction may suddenly cause more lead to be released from a lead service line in the area.").

[147] *See* WBEZ, *Does My Home Have Lead Pipes? Check Your Chicago Address*, https://www.wbez.org/environment/does-my-home-have-lead-pipes-check-your-chicago-address (last visited Nov. 17, 2026).

[148] *Chicago Health Atlas: Englewood*, *supra* note 14 (lead poisoning rate).

[149] U.S. EPA, *supra* note 146 ("EPA and the Centers for Disease Control and Prevention (CDC) agree that there is no known safe level of lead in a child's blood.").

The vibration-related risk extends beyond lead. Increased ground vibration from the Proposed Transaction's higher-volume rail and yard operations threaten to accelerate the deterioration of Englewood's water mains and sewage lines. As these lines deteriorate, there is substantially greater risk of sewage entering the drinking water of residents. Where there is close proximity between water mains and sewer lines, there is greater risk for drinking water contamination.[150] In Chicago, the City's Office of Inspector General has reported 1,204 noncompliant locations in 2024, where water mains and sewer lines did not meet the required separation.[151] The report further explains that, because the City's water network has lost full pressurization multiple times in recent years, compliant separation is the last protection against contamination events.[152] Many of these noncompliant locations are on the City's south side, where the Englewood community is located.[153] This already vulnerable infrastructure is the baseline that the Proposed Transaction will weaken; the deterioration due to increased vibration, not the existing infrastructure, is what threatens to turn this vulnerability into a real contamination event. This is an additional public health harm that the Applicants have not evaluated or addressed.

The Board itself has characterized noise and vibration as substantial "costs on the local communities" and imposed conditions to address them.[154] The Board in the CP–KC merger went so far as to find noise-related impacts resulting from the transaction to be "unavoidable adverse . . . impacts, even as conditioned."[155] Accordingly, the Board should impose conditions, as suggested below, to mitigate noise and vibration impacts here.

b. Light and Heat

The Proposed Transaction will also increase light pollution in Englewood, as expanded operations including increased yard activity, rail activity, and ongoing construction operations involve increased light usage in the area. The Applicants' own documents showing an increase in operations around Englewood support a finding of increased light pollution. To the extent that

[150] Illinois law requires separation between water mains and sewer lines by at least ten feet horizontally and eighteen inches vertically. Ill. Admin. Code tit. 35 §§ 370.350(c), 604.1440.

[151] City of Chicago Office of Inspector General, *Advisory Concerning Non-Compliant Separation of Water Mains and Sewers* 1 (Feb. 19, 2025), https://igchicago.org/publications/advisory-non-compliant-water-mains-sewers.

[152] *Id.*

[153] *Id.* at Appendix A: OIG Letter, 3.

[154] CN–EJE Decision No. 16 at 33–34.

[155] CP–KC Decision No. 35 at 183–84.

the increased operations will extend into evening hours, increased nighttime lighting will disrupt circadian rhythms and sleep, resulting in adverse health consequences to residents.[156]

The same expansion will also intensify the urban heat island effect around the 47th Street Yard. Large, paved freight facilities raise land surface temperatures measurably.[157] Increased operations at the 47th Street Yard will create a higher concentration freight area that will increase the thermal footprint of the yard. Researchers have found that "the warming effect of impervious surfaces is substantially amplified in freight facilities areas, while ecological functions are suppressed or even nullified in highly concentrated areas."[158] Meaning that while high-volume freight facilities, such as the consolidated 47th Street Yard after the Proposed Transaction, have been directly linked to increased land temperatures that outpace ecological mitigation measures. The Proposed Transaction will concentrate freight at the yard through the diversion of intermodal traffic from other facilities, resulting in added trucks, equipment, freight containers, and other components that enlarge a facility's thermal footprint. Elevated urban heat is a recognized public health hazard that contributes to heat-related illness and death, with impacts falling hardest on communities such as Englewood, where there is a substantial percentage of aging and high-risk individuals.[159] Englewood already experiences extreme heat vulnerability, with a Heat and Health Index reaching the maximum vulnerability value in some areas.[160] The added heat burden is a therefore a public health impact that will be exacerbated by the Proposed Transaction. Thus, the Board must weigh it in the public interest balancing and should impose mitigation conditions to address the harm.

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[156] Am. Med. Ass'n, Council on Sci. & Pub. Health, Rep. 2-A-16, *Human and Environmental Effects of Light Emitting Diode (LED) Community Lighting* (2016), https://policysearch.ama-assn.org/councilreports/downloadreport?uri=/councilreports/a16_csaph2.pdf.

[157] Congxiao Yan et al., *Freight Footprints and Urban Heat Islands*, 136 Sustainable Cities & Soc'y (2026), https://doi.org/10.1016/j.scs.2025.107105.

[158] *Id.*

[159] *See* Chicago Metro. Agency for Plan., *Heat Vulnerability Index for Northeastern Illinois 2026*, at 4 (2026), https://cmap.illinois.gov/wp-content/uploads/dlm_uploads/Heat-vulnerability-index-methodology-report.pdf; *see supra* note 113 (describing Englewood's aging population); *Learn What to Do: Heat Preparedness*, Chicago Dep't of Pub. Health, https://www.chicago.gov/city/en/depts/cdph/supp_info/public_health_preparedness/heat-preparedness.html (last visited Nov. 17, 2026) (noting that older adults and people with disabilities are among the most vulnerable for heat-related illness and death).

[160] *See* Chicago Health Atlas, *Heat and Health Index*, https://chicagohealthatlas.org/indicators/HHI (last visited Nov. 11, 2026) (reporting that Englewood has a Heat and Health Index score of 0.9, indicating high vulnerability to extreme heat, because "[h]igher values represent more vulnerable areas").

2. The Board should order mitigation to address increased noise, vibration, light, and heat-related harms.

If it approves the Proposed Transaction, the Board should impose conditions to mitigate any harms in Englewood that can be mitigated.[161] Although this is the first major merger transaction to be decided under the heightened public interest standard, the Board has imposed nearly identical conditions to those proposed below to mitigate the same sorts of harms in prior transactions evaluated under more lenient standards.[162]

a. Noise and vibration-related mitigation

SEI asks the Board to condition any approval of this Proposed Transaction on the noise reduction vibration protection measures set out below. However, certain vibration-related harms cannot fully be mitigated by conditions, and therefore the Board must count them as residual harms when conducting the public interest balancing. Therefore, SEI requests that the Board require:

- **Noise barriers.** Install physical noise controls such as noise barriers, vegetation, and berms near residential areas in Englewood along the 47th Street Yard, the surrounding rail corridor, the operations expanding south towards 55th Street, and along the segments where rail activity will increase.[163]

- **Quiet Zone funding.** Fund the improvements necessary to allow Englewood to obtain a railroad Quiet Zone and promptly assist Englewood "in identifying supplemental or alternative safety measures, practical operational methods, or technologies that may enable the community to establish Quiet Zones in accordance with FRA's final rule on the 'Use of Locomotive Horns at Highway-Rail Grade Crossings.'"[164]

- **Residential sound insulation.** Fund residential sound insulation, such as upgraded windows and doors, for the residences and schools affected by increased rail

[161] *See supra* section III.

[162] In two recent proceedings, both the CN–EJE and CP–KC mergers, the Board has imposed virtually identical conditions as the ones identified below. *See* CN–EJE Decision No. 16 at 69-70; *see also* CP–KC Decision No. 35 at 202–03. The Board imposed those conditions even though CN–EJ&E was a minor transaction and CP–KC was decided under the weaker pre-2001 standards; the heightened standard governing this proceeding provides even stronger footing for imposing them. This confirms that the measures requested are operationally feasible and within the Board's power to impose in order to ensure the transaction is consistent with the public interest.

[163] *See* CN–EJE Decision No. 16 at 69 (VM 77).

[164] See CP–KC Decision No. 35 at 202 (VM-Noise-01); *id.* at 203 (MM-Noise-05); *supra* note 132.

and yard noise through the broader Community Mitigation Fund proposed above. Chicago has a proven local model for this measure. Chicago's Residential Sound Insulation Program has already sound-insulated more than 21,600 homes against transportation noise, [165] confirming that funder-paid residential insulation is feasible and reasonable.

- **Construction noise limits.** Limit construction-related noise near residential areas, including by confining construction activity to daytime hours and ensuring construction maintenance vehicles have properly functioning mufflers to control noise.[166]

- **Comply with regulations.** Comply with the Federal Railroad Administration's regulations establishing decibel limits for train operations.[167]

- **Noise-reduction operating practices.** Adopt noise-reduction operational practices including: maintaining rail car wheels in good working order and minimizing the development of wheel flats, inspecting new and existing rail for rough surfaces and grinding these surfaces to provide a smooth rail surfaces during operations, maintaining locomotives and keeping mufflers in good working order, using continuously welded rail in order to reduce wheel/rail wayside noise, and lubricating curves where doing so would both be consistent with safe and efficient operating practices and significantly reduce noise for residential or other noise sensitive receptors.[168]

- **Maintenance standards.** Install and maintain rail and rail beds according to American Railway Engineering and Maintenance-of-Way Association (AREMA) standards.[169]

- **Community Mitigation Fund.** Establish a fund authorized for expenditure on other residential home improvements necessary to mitigate noise- and vibration-related

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[165] Residential sound insulation is an established and administrable form of transportation-noise mitigation. Chicago's Residential Sound Insulation Program has sound-insulated more than 21,600 homes affected by aircraft noise at O'Hare and Midway International Airports. *See* Chicago Dep't of Aviation, *Window Showroom Opens at Midway International Airport as Part of Noise and Odor Mitigation Programs* (Sep. 30, 2022), https://www.chicago.gov/city/en/depts/doa/provdrs/dbata/news/2022/september/93022.html.

[166] *See* CN–EJE Decision No. 16 at 69 (VM 78, VM 79); CP–KC Decision No. 35 at 202 (VM-Noise-02) (confining the noisiest construction to the hours between 2100 and 0700 local time).

[167] *See* CN–EJE Decision No. 16 at 70 (VM 82); CP–KC Decision No. 35 at 202 (MM-Noise-02).

[168] *See* CN–EJE Decision No. 16 at 69 (VM 80); CP–KC Decision No. 35 at 202–03 (VM-Noise-03, MM-Noise-03, MM-Noise-04).

[169] *See* CN–EJE Decision No. 16 at 70 (VM 81); CP–KC Decision No. 35 at 202 (MM-Noise-01).

harms, including the door and window improvements discussed above, but also foundation repairs, home hardening, lead water testing and lead service line replacement, water main repair and replacement, and sewer line repair and replacement.

b. Light and heat-related mitigation

Increased light and heat burdens in Englewood should be mitigated through conditions if the Board approves this transaction. The Board has already recognized rail-related lighting as a cognizable impact warranting mitigation, and in the CP–KC merger it adopted an enforceable standard to control it.[170] The Board has not previously addressed a rail facility's heat island effects in the same manner, but the measures SEI proposes below are well-established, operationally feasible design practices that fall within the Board's authority to condition approval on mitigation of public interest harms. Because the 47th Street Yard sits immediately adjacent to a residential neighborhood, both full-cutoff fixtures and heat-mitigating design features are practical means of containing the facility's light and heat impacts within the rail corridor rather than casting them into nearby homes.

Therefore, SEI asks the Board to condition any approval of this Proposed Transaction on the light and heat mitigation measures set out below, and requests that the Board require:

- **Full-cutoff lighting.** For any new or replacement permanent lighting at the 47th Street Yard or along the affected line, install downward-facing, full-cutoff fixtures of equal or lower intensity, to limit light trespass into adjacent homes. The fixtures should continue to provide sufficient illumination for security purposes at the yard and along the rail corridor.

- **Heat-mitigating design.** Incorporate heat-mitigating design at and around the 47th Street Yard, such as the use of cooling, high-albedo pavement; solar canopies that provide shade and power generation; green stormwater infrastructure to offset the facility's urban heat island effect, and onsite tree-planting.[171]

- **Residential heat resilience fund.** Include heat-mitigation measures as eligible within the Community Mitigation Fund described above. Such heat mitigation measures eligible for funding should include air conditioning installation, tree-planting on private properties, home energy efficiency improvements, and other heat-reduction measures.

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[170] *See* CP–KC Decision No. 35 at 207 (VM-Biological-07–08: the Board adopted lighting conditions to protect migratory species).

[171] *See* Bill Updike et al., *Shifting Federal Investments to Address Extreme Heat Through Green and Resilient Infrastructure*, Fed'n of Am. Scientists, Day One Project (April 4, 2024), https://fas.org/publication/shifting-to-resilient-infrastructure (proposing mitigation measures to reduce the urban heat island effect).

C. Air Quality

The boom in rail, truck, and yard activity that the Proposed Transaction will bring to Englewood will mean a significant increase in diesel emissions. NU researchers' analyses of the public health impacts of merger-related changes project a 25–37% increase in air pollution-related mortality, 37% increase in adult asthma, and 37% increase in pediatric asthma.[172] Given the Board's duty to ensure rail transportation "operate[s] . . . without detriment to the public health and safety," it should consider these effects and require mitigation if it approves the transaction.

1. Applicants' claims of national air quality benefits are unsubstantiated, insignificant, and ignore local air quality harms entirely.

Applicants have centered air quality benefits in making their case that the Proposed Transaction would advance the public interest, arguing that the nation will "benefit from reduced emissions and improved air quality."[173] Specifically, they cite "Environmental and Safety" benefits as a top-three reason that the Proposed Transaction is in the public interest, asserting that the truck-to-rail diversion and operational efficiencies of the combined system will save 2.5 million gallons of diesel consumption.[174] These savings, Applicants explain, equate to reducing nationwide air pollution by 35,000 metric tons of CO_2e, 389 tons of NO_x, and 12 tons of particulate matter.[175] But these reductions, when measured against Applicants' combined 2023 diesel consumption of ~1,200 million gallons, would represent only 0.2% of systemwide emissions of each of these pollutants.[176] Indeed, the shipping growth on NS's system alone from 2023 to 2025 increased its diesel consumption by ~14 million gallons,[177] subsuming the claimed savings from the combined system and any associated emissions reductions several times over.

Given that the claimed nationwide emissions reductions benefits of the Proposed Transaction are insignificant in the nationwide context, Applicants attempt to inflate their

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[172] Memorandum from Anastasia Oehlerking et al. to Counsel for SEI, *Re: Air Quality and Health Analyses for Impacts of the 47th Street Rail Yard and Proposed UPNS Merger in Englewood, Chicago*, at 20 (Nov. 18, 2026) ("Att. C").

[173] Rev. Appl. 1-20–21; *see also id*. 1-25–26, 1-47–49.

[174] Rev. Appl. 1-17–26; Graham V.S., Workpaper "Railroad Emission Data Inventory," Tab "Optimized Plan Emissions".

[175] Rev. Appl. 1-25.

[176] *See* Graham V.S., Workpaper "Railroad Emission Data Inventory," Tab "UP C-Rate Data" (2023 UPRR R-1 reporting 837,500,000,000 total GTM), Tab "NS C-Rate Data" (reporting 341,200,000,000 total GTM in 2023), Tab "Optimized Plan Emissions" (reporting 2023 C-Rates).

[177] *See* Graham V.S., Workpaper "Railroad Emission Data Inventory," Tab "NS C-Rate Data."

emissions reductions claims by citing reductions from fuel efficiency initiatives that UP has already deployed over the past quarter century.[178] In explaining the "Environmental and Safety Benefits" of the Proposed Transaction, Applicants claim the predicted truck-to-train diversion will "reduce emissions by approximately 4.0 million metric tons of CO_2e, 2,850 tons of NO_x, and 85 tons of particulate matter."[179] But Applicants' supporting materials and workpapers show these as reductions UP claims to have already achieved from 2000 to 2025 through its fuel economy initiatives[180] – not future reductions resulting from the Proposed Transaction.

The projected emissions reductions are not only minuscule in the context of Applicants' nationwide emissions, but they also fall far short of demonstrating those relatively small national emissions reductions will produce any meaningful environmental and safety benefits. The reduction of CO_2e, for example, may be relevant for climate considerations, but it has little direct effect on health and safety—localized impacts that must be considered in the public interest determination.[181] To the extent that Applicants do mention freight-related pollutants, they again discuss only the global reduction in NO_x and PM emissions, even though the health effects of these pollutants are localized.[182]

2. The Proposed Transaction will harm local air quality and public health in Englewood.

Citing limited emissions reductions, Applicants boldly claim that the Proposed Transaction "does not risk harm to the public interest,"[183] but facts developed in this proceeding and independent analyses by Northwestern University researchers show the opposite in terms of health and safety for the people of Englewood.

a. Applicants have failed entirely to address local air quality impacts of the Proposed Transaction.

Applicants have completely failed to seriously consider the effect of the Proposed Transaction on community health and safety. This is particularly striking given that the major

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[178] Rev. Appl. 1-49.

[179] *Id.*

[180] *See* Rev App 1-641 to 1-642, Graham V.S. at 3 ¶ 8; Graham. V.S., Workpaper "Railroad Emission Data Inventory," Tab "UP Emissions Savings Since 2000."

[181] *See Union Pac. Corp.—Control—Norfolk S. Corp.* (Decision No. 21), FD 36873 et al., slip op. at 18 (STB served May 28, 2026) ("The [new] rules also strengthened consideration of a merger's impacts on communities"); *see also* 49 U.S.C. § 10101 ("[I]t is the policy of the United States Government . . . to operate transportation facilities and equipment without detriment to the public health and safety.").

[182] *Id*.

[183] Rev. Appl. 1-21.

merger rules have "strengthened consideration of the merger's impacts on communities."[184] Applicants are required to "quantify the likely negative effects" of their proposal and "propose measures to mitigate and offset merger-related harms."[185] While Applicants have identified several rail segments surrounding Englewood and the 47th Street Yard where traffic will surge and emissions will increase, the Revised Application is silent as to the resultant adverse health impacts on communities like these. Nor do Applicants propose any measures to mitigate such harms.[186] Applicants' discovery responses indicate they have not assessed air quality or health impacts at the 47th Street Yard or other locations where activity will surge post-merger, and they refused to timely produce information vital to quantifying local emissions increases.[187]

In other words, not only have Applicants failed to adequately present the merits and mitigation plans related to air quality as required by the Board's rules, but they also obfuscate and prevent any other party in the proceeding from uncovering the depth of the relevant public interest health impacts, continuing their troubling approach of a "lack of transparency."[188]

b. Estimated Public Interest Harms from 47th Street Yard Activity Emissions

The projected increase in rail, shipping, and truck activity resulting from the Proposed Transaction would mean more diesel emissions at and near the 47th Street Yard from sources including locomotives, trucks, and other equipment that operates on diesel, including cranes. Diesel emissions, including NO_x and $PM_{2.5}$, are associated with a variety of adverse health impacts, including asthma, respiratory disease, cardiovascular stress, lung cancer, and premature mortality.[189]

Northwestern University's Climate Change Research Group (CCRG) analyzed the likely health and safety impacts in Englewood of a subset of those merger-related emissions increases:

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[184] *See Union Pac. Corp.—Control—Norfolk S. Corp. (Decision No. 21)*, FD 36873 et al., slip op. at 18 (STB served May 28, 2026).

[185] 49 C.F.R. § 1180.6(b)(11), (10)

[186] Rev. Appl. 1-90–92 ("Conditions to mitigate and offset merger-related harms")

[187] *See* SEI's First Set of Discovery Requests, Interrogatory Nos. 2, 3, 4, 19; *see generally* NS's Resps. & Objs. to Interrogatories in SEI's First Set of Disc. Reqs.; *see* UP's Resps. & Objs. to SEI's First Set of Disc. Reqs., 4–22. As explained in *supra* note 3, NS provided a supplemental response to SEI's discovery requests related to some of these issues after business hours on November 17, 2026, the night before the Board's deadline for these comments. Obviously, SEI has had no opportunity to review those supplemental responses and therefore reserves its rights to supplement its position and technical analyses on these points.

[188] *See Union Pac. Corp.—Control—Norfolk S. Corp. (Decision No. 37)*, FD 36873 et al., slip. op. at 5 (STB Served Sep. 18, 2026) (Klostner, concurring).

[189] Att. C, Oehlerking et al., at 2.

changes in truck, rail segment, and yard activity within the 47th Street Yard post-merger. Their analysis is detailed in **Attachment C.**[190] The CCRG conducted a localized air quality analysis of the Proposed Transaction's effects on Englewood, based on increased hostler truck, crane activity, rail, and drayage truck activity within the 47th Street Yard.[191] Notably, this analysis focused on emissions from sources that remain in the yard, so it did not capture emissions from the trains or freight trucks that exist and enter the yard.[192] Specifically, the CCRG modeled how diesel emissions from activity within the yard are likely to disperse and settle throughout Englewood under both a baseline scenario in 2025 and five years after the Proposed Transaction, accounting for 6.6% growth and 2.2% truck-to-rail diversion.[193] The neighborhood-scale resolution for this analysis was essential, because pollutants like NO_x and $PM_{2.5}$ are most concentrated near their source and fall off sharply with distance.[194]

The results of CCRG's air pollution profile near the 47th Street Yard are presented below in **Figure 2.** It shows how the concentration of NO_x and $PM_{2.5}$ near the yard will change as a result of the Proposed Transaction, where each graphic represents the 1-mile radius from a location at the center of the Englewood yard. The pink and orange areas show locations projected to see a localized increase in NO_x and $PM_{2.5}$ pollution after the Proposed Transaction, representing an increase of 36% and 24%, respectively.[195]

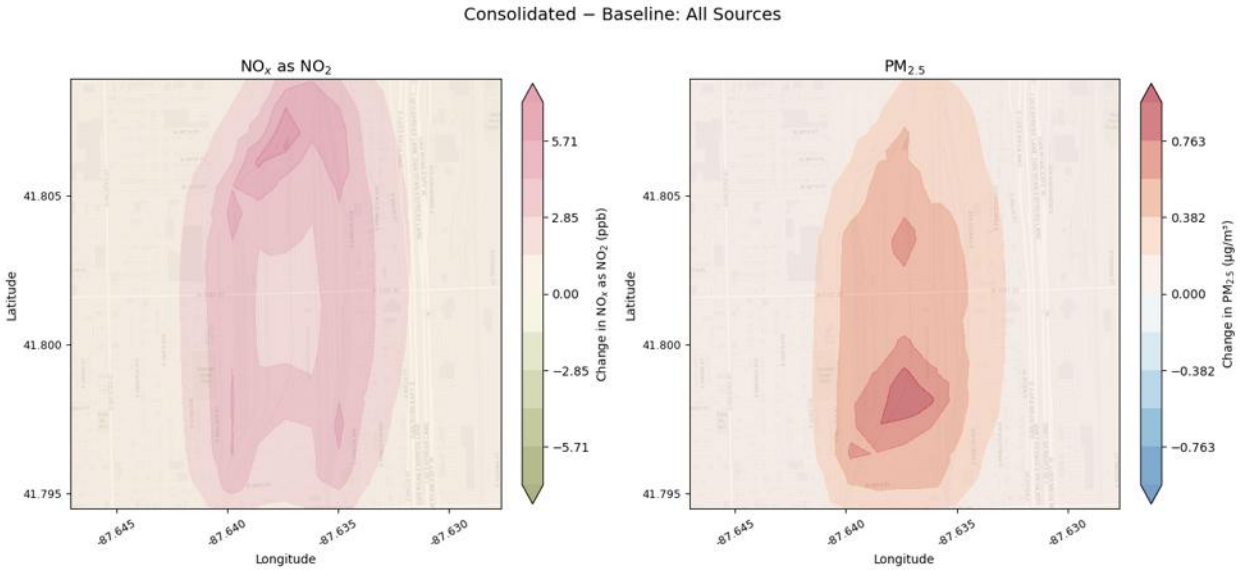

Figure 2. *Spatial distribution of NO_x and $PM_{2.5}$, reflecting changes from 2025 baseline activity at the 47th Street Yard with activity estimates 5 years post-merger, accounting for 6.6%*

[190] *Id*.

[191] *Id*. at 6–9.

[192] *Id.* at 9.

[193] *Id.* at 9–14.

[194] *Id*. at 2.

[195] *Id*. at 2, 16.

baseline growth and 2.2% truck-to-rail diversion. Each plot is a 1 mi by 1 mi square, centered at the 47th Street Yard. The change in concentration of each pollutant at a given location is plotted, with darker shades of pink and orange representing the greater increases in NO_x and $PM_{2.5}$.[196]

Using these neighborhood-scale profiles of projected concentration of yard-related air pollution in Englewood, CCRG analyzed associated health outcomes, including mortality and asthma.[197] CCRG projects a 36% increase in NO_x and 24% increase in $PM_{2.5}$ adjacent to the yard would correspond to a 25-37% increase in all-cause mortality incidents, as well as a 37% increase in both adult and pediatric asthma.[198]

It is likely that the health impacts in Englewood are even more significant than the modeling suggests. First and foremost, this model does not account for the emissions of the trucks and trains as they bring freight onto and out of the yard,[199] and it applied conservative estimates regarding post-merger growth that are below even Applicants' own estimates.[200] The modeling also does not account fully for age, and the health risks from NO_x and $PM_{2.5}$ to children and older adults are heightened as compared to the rest of the population. The plume represented in **Figure 2** will impact the surrounding high-density residential neighborhood immediately adjacent to the yard; the area is full of locations where older adults and children congregate, including elementary and high schools, parks and playgrounds, food pantries, and places of worship.[201] Additionally, the analysis did not account for pollutants, like ozone, formed through secondary reactions after emissions leave the source.[202] This is significant because Chicago is already a nonattainment area for ozone and therefore substantial related health impacts are not captured in CCRG's projections. Furthermore, the health-response function only looks at first-order reactions with the measured pollutants; community members will be exposed to multiple hazards, both primary and secondary pollutants, and the health-response function

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[196] *Id*. at 18 (Figure 6).

[197] *Id*. at 18; *see generally* Hector Castaneda et al., Stationary Source Div., Cal. Air Res. Bd., *Health Risk Assessment for the BNSF Railway San Bernardino Railyard* (2008), https://ww2.arb.ca.gov/sites/default/files/classic/railyard/hra/bnsf_sb_final.pdf; Environ. Int'l Corp., *Air Dispersion Modeling Assessment of Air Toxic Emissions from BNSF Commerce/Mechanical Rail Yard* (2006), https://ww2.arb.ca.gov/sites/default/files/classic/railyard/hra/env_sheila_admrpt.pdf (prepared for BNSF Ry. Co. and submitted to Cal. Air Res. Bd.).

[198] Att. C, Oehlerking et al. at 2, 18.

[199] *Id*. at 20.

[200] *Id.* at 21–22.

[201] Google Maps, https://maps.app.goo.gl/MjonoGAd9Kkf1cyy9 (last visited Nov. 18, 2026) (showing Dewey Elementary School and Parent Child Center, Tilden High School, KIPP Bloom College Prep, Lowe Samuel Park, New Eclipse Community Alliance – Food Distribution Center, Liberty Temple Church of God, etc.)

[202] Att. C, Oehlerking et al. at 19.

cannot adequately estimate such cumulative effects.[203] Finally, although the model used accounts for some meteorological patterns, our results are expressed as annualized averages.[204] As such, they do not fully capture Chicago's distinctive weather, especially Lake Michigan's effect on local winds, which would have the effect of blowing the plume from the 47th Street Yard westward toward residential streets when blowing in from off the Lake. In general, Lake Michigan's effect produces seasonal swings and short-term spikes in pollutant exposure that an annual average cannot describe, so our model particularly undercounts acute health effects.[205]

In sum, CCRG's independent analyses show that the merger-related increase in activity within the 47th Street Yard will cause harmful diesel emissions to spike in Englewood, which is likely to impact the health and safety of its residents.

c. The Board should include mitigation conditions to address the effects of increased air pollution in Englewood.

The Board has an obligation to mitigate harms to the public interest resulting from the Proposed Transaction, where possible. Here, health harms from the increased yard operations can be mitigated through emissions reduction strategies including truck electrification, and thus, the Board should require it as a condition of any approval of the Proposed Transaction. Broader air quality impacts from the Proposed Transaction should also be mitigated through additional conditions on any Board order approving it.

i. Yard Truck Electrification

Given that the local health impacts of the Proposed Transaction are rooted in the anticipated spike in diesel combustion, electrification of the yard-truck equipment is an attractive first step toward mitigating emissions.

Replacing diesel yard trucks with electric yard trucks is an emission-reduction measure already being deployed at yards across the country. Zero-emission yard-truck usage accounted for 43% of all compliance activity under the WAIRE program in Southern California, whereas near-zero-emission truck visits and infrastructure improvements represented 27% and 9%, respectively.[206] Hostler usage accounted for 54% of all compliance activity in 2021, the first year

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[203] *Id.*

[204] *Id.* at 20.

[205] *Id.*

[206] Caitlin Dawson et al., *S. Coast Air Quality Mgmt. Dist., 3rd Annual Report for the Warehouse Actions and Investments to Reduce Emissions (WAIRE) Program* 1, 23 (2026), https://www.aqmd.gov/docs/default-source/planning/fbmsm-docs/3rd-annual-report-for-the-waire-program.pdf.

after the program was implemented, indicating that hostler usage and acquisition accounted for the majority of early-stage emission-reduction efforts in Southern California warehouses.[207]

Electrification of yard trucks is a preferred air quality mitigation measure because battery-electric yard trucks are inexpensive relative to other electric equipment and have fewer barriers to implementation. First, yard trucks operate on short routes, in fixed locations near charging infrastructure, with predictable duty cycles, and in controlled environments – making them extremely suitable for battery-electric technology.[208] Second, drayage trucks, in addition to facing technological challenges, are 80% owner-operated at intermodal facilities.[209] Applicants may not control the acquisition of low-emission drayage trucks, whereas they have full control over the infrastructure and cargo-handling equipment of their intermodal railyard. Third, yard trucks have a lower up-front capital cost than other electrified equipment.[210] Additionally, while hostler trucks do have a higher capital cost than their diesel counterparts, as is typical for low- and zero-emission technologies, they have lower maintenance costs as well.[211]

Northwestern University researchers modeled the impacts and potential benefits of electrifying yard trucks needed to handle post-merger shipping activity at the 47th Street Yard, as represented below in **Figure 3**. This change would reduce post-merger NO_x emissions to 28% (as opposed to 36% without electrification) and $PM_{2.5}$ increases to 1% (as opposed to 24% without electrification).[212] These emissions reductions would limit the projected merger-related increases in mortality and asthma rates.[213] The net cost of yard truck electrification, by the

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[207] *Id*. at 44 (Figure A-7).

[208] Union of Concerned Scientists, *Truck Electrification: Cutting Oil Consumption & Reducing Pollution* 3–4 (2012), https://www.ucs.org/resources/truck-electrification.

[209] Intermodal Ass'n of N. Am., *Independent Contractors in the Intermodal Industry* 1 (2024), https://www.intermodal.org/documents/Independent_Contractor_White_Paper_Feb_2024.pdf.

[210] San Pedro Bay Ports, *2024 Update: Feasibility Assessment for Cargo-Handling Equipment* 5–7 tbl.5-5, 5-14 tbl.5-10, 5-21 tbl.5-15, 5-30 tbl.5-20 (2026), https://cleanairactionplan.org/download/239/cargo-handling-equipment/5416/2024-cargo-handling-equipment-feasibility-asessment-final.pdf (listing purchase prices of $375,000 for battery-electric yard tractors, compared with $550,000 for battery-electric large-capacity forklifts, $1.7 million for battery-electric top handlers, and $2.25 million or more for electric RTG cranes); San Pedro Bay Ports, *2024 Class 8 Drayage Truck Feasibility Assessment* 64 tbl.13, 71 tbl.16 (2025), https://cleanairactionplan.org/download/240/trucks/5386/final-report_2024-ze-drayage-truck-feasibility-assessment.pdf (listing a pre-tax purchase price of $416,102 for a battery-electric Class 8 drayage truck).

[211] San Pedro Bay Ports, at 5-5, 5-7 tbl. 5-5 (modeling battery-electric yard tractor maintenance costs 29% lower than diesel, at $20 versus $28 per hour).

[212] Att. C., Oehlerking et al., at 2.

[213] *Id*.

Northwestern University researchers' estimates, would be only 0.4% of the $2 billion in capital expenditures the Applicants have planned to execute the Proposed Transaction.[214]

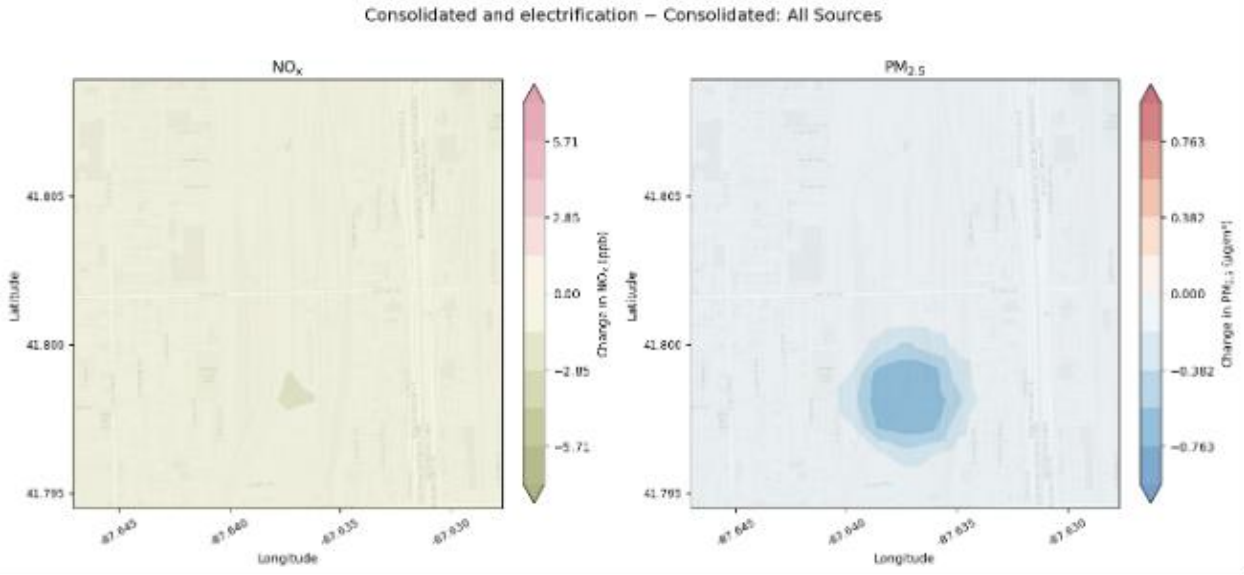

Figure 3. *Spatial distribution of NO_x and $PM_{2.5}$, reflecting changes after 100% yard truck electrification of activity estimates 5 years post-merger, accounting for 6.6% baseline growth and 2.2% truck-to-rail diversion. Each plot is a 1 mi by 1 mi square, centered at the 47th Street Yard. The change in concentration of each pollutant at a given location is plotted, with darker shades of green and blue representing the greater decreases in NO_x and $PM_{2.5}$.*

Yard truck electrification would be a beneficial step but would not fully offset the health effects of the Proposed Transaction in Englewood. Accounting for the boom in activity from the Proposed Transaction, even with a fleet of fully electric yard trucks, Englewood may still be facing 17-34% increase in mortality, 35% increase in adult asthma, and 34% increase in pediatric asthma as compared to the post-merger scenario without electrification.[215] Thus, while yard truck electrification would be a positive measure, the Board should require additional mitigation for air quality impacts at the 47th Street Yard – already NS's busiest facility.

ii. Additional mitigation conditions to address air quality impacts of the Proposed Transaction

To address serious air quality and health impacts at one of the combined system's busiest intermodal terminals, the Board should condition any approval of the Proposed Transaction on the following mitigation measures:

- **Truck routing and operating hours**. Require designated truck routes to and from the 47th Street Yard and restricted operating times, designed so truck traffic avoids

[214] Rev. Appl. 1-59; Att. C, Oehlerking et al., at 16 (tbl. 6).

[215] Att. C, Oehlerking et al., at 2.

places and times at which children and other vulnerable populations are active, such as schools, playgrounds, parks, senior housing, and places of worship, particularly during school arrival and dismissal. Such a truck routing condition should also account for road safety concerns addressed above in Section V.I.

- **Public health measures in a Community Mitigation Fund**. Require a general mitigation fund, administered by or with direction of Englewood residents, that can fund screening and treatment for asthma, respiratory, and cardiovascular disease; expanded access to care; and prevention measures such as HEPA air filtration in homes, schools, and community facilities near the 47th Street Yard.

- **Air quality monitoring**. Require applicants to fund installation of real-time air quality monitors measuring $PM_{2.5}$, NO_x, and diesel particulate matter at the yard fence line and at sensitive locations in Englewood, with data made publicly available. This monitoring should be integrated into the City of Chicago's Open Air Monitoring network; accordingly, the mitigation condition could involve Applicants providing dedicated funding to the City for this purpose.[216]

- **Yard Electrification Plan**: Require Applicants to file with the Board, within six months of the Board's final decision, a Yard Electrification Plan that includes a deployment schedule with specific deadlines over a five-year period and interim milestones. The Board should require annual reports on progress as to the Plan. The Plan should be consistent with strategic planning and priorities of the Chicago Metropolitan Agency for Planning and be designed to make the 47th Street Yard a global model yard in terms of excellence in environmental performance. It should include plans for yard truck electrification as well as other emission reduction strategies, including:

    - Crane electrification: replace diesel cranes with fully electric cranes.

    - Cleaner locomotives: require priority deployment with clear deadlines of the lowest-emitting available locomotives, including Tier 4 and battery-electric switchers, for service to the 47th Street Yard and the Englewood rail segments.

- **Idling limits.** Restrict idling of trucks, locomotives, and yard equipment at the 47th Street Yard, using the City of Chicago's Quiet Zone ordinance[217] and anti-idling rules as the benchmark: no diesel vehicle may idle for more than three minutes in any

[216] Chicago Dep't of Pub. Health, *Open Air Chicago*, City of Chicago, https://www.chicago.gov/city/en/depts/cdph/supp_info/Environment/open-air-chicago.html (last visited Nov. 18, 2026).

[217] Chicago, Ill., Mun. Code §§ 10-8-010 to -030 (barring heavy trucks from streets abutting hospitals between 2:00 and 7:00 a.m.).

sixty-minute period.[218] Require anti-idling technology and monitoring, including publicly reporting compliance, and require Applicants and third-party operators to pay a specified fine into the Community Mitigation Fund for each violation.

- **Repositioning of yard activity**. Require the relocation of the highest-emitting yard operations, such as crane lifts, truck staging, and locomotive idling, to areas of the yard farthest from homes, schools, and parks, in concert with Mitigation Request 1, "Truck Routing," above and pending deployment of electrified alternatives.

- **Vegetative and physical buffers**. Require Applicants to install tree plantings, green walls, and/or particulate barriers along the yard perimeter and primary truck routes.

- **Public reporting**. Require annual public reporting to the Board and the community of yard activity levels, idling, electrification progress, and monitoring results throughout the oversight period.

As discussed above, several of these air pollution measures in particular – the funding for health services, home and school air filtration, air quality monitoring, and vegetative buffers – should be consolidated into a Community Mitigation Fund, the details of which should be developed, negotiated, and administered with input from Englewood residents, consistent with the Board's recognition that "no one is in a better position to determine what mitigation measures are needed and appropriate than the affected community itself."[219] The remaining measures are operational and should be imposed directly as conditions of approval.

D. Impacts Related to Increased Hazardous Materials Risks in Englewood

1. The Proposed Transaction will increase the risk of hazardous materials releases in Englewood.

The Application does not seriously address the increased risks of hazardous material contamination resulting from the Proposed Transactions and makes no effort to assess those risks in relation to the increase in local freight activity at the 47th Street Yard. Applicants' central proposition on this topic is a brief assertion that risks of hazardous material releases across the country will be reduced as a function of diverting truck traffic to rail because "hazardous-material releases are less likely when those materials are transported by rail instead of by truck."[220] While the rates of accidents may be lower for rail than trucking, rail accidents tend to result in larger-scale injuries and damages compared to truck accidents.[221] Furthermore, the

[218] *Id*. § 9-80-095(a) (prohibiting diesel motor vehicles from idling more than three minutes in any sixty-minute period).

[219] CN–EJE Decision No. 16 at 57.

[220] Rev. Appl. 1-26.

[221] Ben Goldman, Cong. Rsch. Serv., R47911, Freight Rail Safety Issues in the 119th Congress 2 (2026) ("[H]azmat-by-rail releases tend to result in more damage (as measured in dollars) per

benefits of risk reduction through diversion to rail transport are diffuse, spread across shippers and the national economy, while the harms of hazardous material releases will be concentrated where such releases occur, which is more likely in the communities through which more hazardous materials move and are handled. Applicants' national framing ignores how the Proposed Transaction would increase the risk of hazardous material contamination in specific communities like Englewood that will experience a surge in truck, rail, and yard activity. This increased risk is a harm to the public interest that the Applicants fail to address, let alone mitigate.[222]

As a threshold matter, Applicants fail to acknowledge that certain communities, including Englewood, will experience an increased volume of hazardous material rail traffic and, consequently, an increased risk of hazardous material contamination as a direct result of the Proposed Transaction. Hazardous materials already constitute a higher proportion of Illinois freight than the national average.[223] As the volume of hazardous materials shipped increases, so does the risk of hazardous material release through collisions, derailments, and non-accident releases.[224] A derailment can breach a tank car shell, tear off a bottom outlet valve, or puncture adjacent cars with couplers, causing an acute contamination event that releases large quantities at once.[225] Collisions, particularly at grade crossings, do the same.[226] Hazardous materials releases from train accidents may pose risks of "[t]oxic vapors, pool fires, explosions, soil and

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incident than highway or pipeline spills."); Maureen F. Orr et al., *Public Health Risks of Railroad Hazardous Substance Emergency Events,* 43 J. Occ. & Env't Med. 94, 96 (2001) ("A greater percentage of members of the public and emergency response personnel were injured during railroad events compared to nonrailroad events. . . . Based on the type of medical treatment received, the injuries of railroad victims were slightly more severe than nonrailroad victims.").

[222] *See* 49 C.F.R. § 1180.1(c); *id.* § 1180.6(b)(10)–(11) (requiring applicants to identify merger-related harms and propose measures to mitigate them).

[223] Ill. Com. Comm'n, *Annual Report on Accidents/Incidents Involving Hazardous Materials on Railroads in Illinois* at 6 (2025).

[224] J. Gertler et al., Fed. R.R. Admin., U.S. Dep't of Transp., DOT/FRA/ORD-99/05, *Non-Accident Release of Hazmat from Railroad Tank Cars: Training Issues* at 4 (1999), https://railroads.dot.gov/elibrary/non-accident-release-hazmat-railroad-tank-cars-training-issues-0.

[225] Nat'l Transp. Safety Bd., NTSB/RIR-26-07, *Canadian Pacific Kansas City Railroad Derailment with Subsequent Hazardous Materials Release and Fire, Bordulac, North Dakota, July 5, 2024*, at 54–55 (2026), https://www.ntsb.gov/investigations/AccidentReports/Reports/RIR2607.pdf.

[226] *See, e.g.*, Fed. R.R. Admin., U.S. Dep't of Transp., *Accident Investigation Summary Report HQ-2022-1654*, at 1 (2024), https://railroads.dot.gov/elibrary/accident-investigation-summary-report-hq-2022-1654 (describing a Norfolk Southern freight train's collision with a dump truck at a grade crossing in Harmarville, Pennsylvania, that derailed seventeen cars, eight of them carrying hazardous materials, and released petroleum distillates into a nearby creek).

groundwater contamination and ecological damage."[227] Non-accident releases, on the other hand, "consist of leaks, splashing and other releases from . . . defective valves . . . and . . . venting from safety relief devices."[228] Releases may occur during loading and unloading, exposing residents to stationary sources of leaks and vapors for long durations.[229] As a result, "[r]esidents living near chemical release incidents face potential exposure to these contaminants through various pathways, including air inhalation, soil ingestion, dermal contact, consumption of food grown or generated in the affected areas (e.g., vegetables, meat, and dairy), and drinking water."[230]

Recognizing that increased traffic will increase hazardous material release risks aligns with how the Board has evaluated hazardous material impacts in previous mergers. In the 2008 CN-EJ&E merger, the Board ordered additional mitigation related to potential hazardous material releases on top of applicants' voluntary mitigation measures, due to the "increase [in] transport of hazardous materials" through communities along the impacted rail line, regardless of the "extremely low" likelihood of a hazardous materials spill.[231]

The Application does not contain sufficient information to assess the overall risk of a hazardous materials release in Englewood. But the rail segment data provided by the Applicants to OEA show that residents living along specific segments will face more hazardous materials traffic, and therefore greater risk. Whatever the net change across the country, an increase in local risk can have devastating consequences for those living in that area. In the Proposed Transaction here, Applicants have identified two rail segments in Englewood along which there will be an increase in the transport of hazardous materials.[232] Rail segment 12307 is expected to receive 937 more carloads annually, and rail segment 12755 is expected to receive 3 more carloads annually.[233] Given that a twenty-foot intermodal container can carry between 3,960 and

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[227] Xiang Liu et al., *Probability Analysis of Multiple-Tank-Car Release Incidents in Railway Hazardous Materials Transportation*, 276 J. Hazardous Materials 442, 444 (2014), https://doi.org/10.1016/j.jhazmat.2014.05.029.

[228] Amirfarrokh Iranitalab, et al., *Stationary Modeling of Types and Consequences of Rail-Based Crude Release Incidents in the United States*, 185 Reliability Eng'g & Sys. Safety 232, 235 (2019). https://doi.org/10.1016/j.ress.2018.12.009.

[229] *Id.*

[230] Shan Niu et al., *Identifying Long-Term Health Risks Associated with Environmental Chemical Incidents*, 478 J. Hazardous Materials 135432, at 2 (2024), https://doi.org/10.1016/j.jhazmat.2024.135432.

[231] Section of Env't Analysis, Surface Transp. Bd., FD 35087, *Final Environmental Impact Statement for the Proposed Canadian National Railway Company Acquisition of the Elgin, Joliet & Eastern Railway Company* ii (2008), https://dcms-external.s3.amazonaws.com/DCMS_External_PROD/1656014258321/CN_EJE_FEIS.pdf (Summary of Major Conclusions, item 8).

[232] IR-3 Data Table, Tab "Rail Line Segments" (segments 12755, 12307).

[233] *Id*.

6,662 gallons,[234] this translates to anywhere from 11,880 to over 6,000,000 more gallons of hazardous materials travelling through Englewood, greatly increasing the risk of release.

In particular, the increased rail traffic that the Proposed Transaction will bring through Englewood will likely result in an increase in toxic inhalation hazards (TIH/PIH) carloads in particular. TIH/PIH are considered "among the most dangerous" hazardous materials, due to their toxicity and ability to spread easily, and chlorine and ammonia "account for 70% and 84% of the transported TIH material."[235] Exposure to these contaminants can cause severe health effects. Chlorine gas irritates the eyes, skin, and respiratory tract in small doses; in large doses it kills within minutes.[236] Anhydrous ammonia burns the moist parts of the body, including the eyes, throat and lungs.[237] Exposure above 700 ppm can cause blindness and other severe or fatal injuries.[238]

TIH releases are thus incredibly damaging. When a derailment in Graniteville, South Carolina, ruptured a chlorine tank car, nine people died, hundreds sought medical care, and the town was evacuated for nearly two weeks.[239] Were it not for the chlorine release, the NTSB later concluded, the accident might have been non-fatal.[240] Furthermore, this accident "took place in a rural setting, at an early morning hour. If a similar accident had occurred in an urban area in the daytime, there might be many casualties and severe economic disruptions[.]"[241] According to a PHMSA report to Congress, if a similar accident had taken place in Chicago, puncturing a tank car, releasing up to 90 tons of chlorine, "there would be [an estimated] 10,000 fatalities, 32,600 non-fatal injuries, and total insurance losses of over $7 billion."[242]

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[234] Int'l Tank Container Org., *Technical Guidance for Shipping Bulk Liquids*, https://www.international-tank-container.org/en/technical/technical-guidance-for-shipping-bulk-liquids (last visited Nov. 17, 2026) (tank containers vs. drums comparison graphic).

[235] Lewis M. Branscomb et al., *Rail Transportation of Toxic Inhalation Hazards: Policy Responses to the Safety and Security Externality* 3–4 (Belfer Ctr. for Sci. & Int'l Affs., Harvard Kennedy Sch., Discussion Paper No. 2010-01, 2010), https://www.belfercenter.org/publication/rail-transportation-toxic-inhalation-hazards-policy-responses-safety-and-security.

[236] *Id.* at 9.

[237] *Id.* at 10.

[238] *Id.*

[239] *Id.* at 19–21.

[240] *Id.* at 20.

[241] *Id.* at 29.

[242] Pipeline & Hazardous Materials Safety Admin., U.S. Dep't of Transp., *Hazardous Materials by Rail Liability Study: Report to Congress* 45 (2017).

That PHMSA report observes an important truth: the ultimate consequences of a hazardous material release, of course, depend on where it happens,[243] and Englewood would be among the worst places for such a release to occur. Both the population density and the population characteristics of Englewood mean a hazardous material release there would affect more people, and those people would be more susceptible to the most dire health and other consequences of such a release. Recent Illinois releases have mostly occurred in rural areas; but offer another stark comparison. In July 2025, for example, a Norfolk Southern derailment near Browns, Illinois, a town with a population of 163 people, breached three hazmat tank cars and spilled 14,000 gallons of molten sulfur.[244] A comparable release in Englewood, where over 2,000 people live within half of a mile east and west of the yard,[245] would reach far more people, in a community whose life expectancy is among the lowest in Chicago and where the community is disproportionately comprised of people in vulnerable groups, like senior citizens, children, and the disabled.[246] And because Chicago is the hub of the national rail network, a major incident in Englewood could shut down lines carrying traffic for the broader network, disrupting freight service and the adequacy of transportation well beyond Englewood.

Applicants fail to fully describe how truck traffic through communities like Englewood – and the associated hazardous materials risks from trucks carrying hazardous materials on local streets – will change as a result of the Proposed Transaction. Applicants' own information shows that Englewood will experience increased truck traffic,[247] but Applicants do not specify how much of that increase will consist of hazardous materials. This is especially important because, by Applicants' own account, trucks are the riskier way to transport hazardous materials. Applicants cannot claim the safety benefit of moving freight off trucks nationally while failing to disclose how the merger will change truck trips on the streets around the 47th Street Yard. Each added truck trip carrying hazardous materials is another chance for a crash or spill near homes,

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[243] Branscomb et al., *supra* note 235, at 30.

[244] Nat'l Transp. Safety Bd., RIR-26-16, *Norfolk Southern Railway Derailment and Collision with Hazardous Materials Release, Browns, Illinois, July 18, 2025*; *see also* ICC 2025 Report, tbl. A.

[245] *Census Tract 8438, Cook, IL*, Census Reporter, https://censusreporter.org/profiles/14000US17031843800-census-tract-8438-cook-il/ (last visited Nov. 17, 2026) (citing U.S. Census Bureau, 2020–2024 American Community Survey 5-Year Estimates).

[246] Chi. Dep't of Pub. Health, *Life Expectancy in Chicago, 2023*, at 4 fig. 6 (Sept. 2025) (Englewood: 67.7 years); *Chicago Health Atlas: Englewood*, *supra* note 14 (reporting 18.0% age 65 and over, and 21.4% age 0 to 18 in Englewood, compared with 13.8% and 19.4% citywide); Chi. Dep't of Pub. Health, *Neighborhood Conditions for Adults with Disability in Chicago*, 2025 at 33 tbl. 5 "Prevalence of disability by community area, 2023-2024" (Englewood: 35.9%).

[247] *Master Data Tables for IR-4.xlsx*, Comment ID EI-34413 to EI-34420, FD 36873 et al., Tab "Intermodal & Auto Ramps," Cell K15 (pdf filed September 25, 2026) ("IR-4 Data Table").

schools, and parks, particularly in Englewood where freight-related crashes are over five times more injurious compared to the rest of Chicago, as described above in V.I.

Furthermore, Applicants also do not acknowledge that increased intermodal yard activity will increase the risk of hazardous material contamination in Englewood. Yard operations carry their own accident risks: cars that run through switches and derail, sideswipes during humping and switching, free-rolling cars, and collisions between sets of cars, each of which can damage tank cars and release their contents.[248] Furthermore, "historically, some of the most catastrophic rail accidents involving hazardous materials have been in classification yards, with effects into the adjacent or nearby neighborhoods" which are often densely populated."[249] Given that the 47th Street Yard is adjacent to residential streets, schools, and parks, the merger-related increases to such hazardous material exposure pathways must be considered and mitigated.

Because Applicants do not acknowledge any increased hazardous materials risk from the Proposed Transaction, they identify no plans to mitigate it and have not carried their burden. The only related measures appear in the hazardous materials section of the Safety Integration Plan.[250] That section mostly describes programs UP and NS already run, which the combined railroad will continue, at least initially, pending a later review, and which do not address the additional risk of hazardous materials releases imposed by the Proposed Transaction.[251] Moreover, the plan makes no firm commitments; even its forward-looking parts describe what Applicants "anticipate" or "expect," and Applicants promise only to assess whether staffing, response assets, and training are sufficient.[252] Most of its programs operate only after an acute release,[253] and none address the chronic spills that would accumulate at a fixed yard next to Englewood residents. Even as to preparing to respond to releases, Applicants' plan may even move backward: NS's RapidSOS platform, adopted after the East Palestine derailment disaster to notify local responders quickly, will only be evaluated, and NS's AskRail emergency contacts

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[248] Xiang Liu et al., Fed. R.R. Admin., U.S. Dep't of Transp., DOT/FRA/ORD-24/24, *Risk Analysis Methodology for Unit and Manifest Trains Transporting Hazardous Material* 14 (2024) ("[C]ompared to mainline line-haul train operations, the practice of switching, sorting, and classifying hazmat railcars in yards requires additional handling processes that introduce the risk of overspeed coupling events, side-swipe collisions, and derailments due to improper use of switches. These events may arise from various human factor causes and/or failure of hump yard speed control systems, and may lead to derailed or damaged railcars and the possibility of a hazmat release.").

[249] *Id.* at 14.

[250] Applicants' Safety Integration Plan ("SIP") at 118, *Union Pacific Corporation and Union Pacific Railroad Company–Control–Norfolk Southern Corporation and Norfolk Southern Railway Company*, EI 34238 (filed Apr. 30, 2026).

[251] *Id.* at 132.

[252] *Id.* at 132–34.

[253] *Id.* at 126–28.

will be redirected to UP, even though these are the tools that matter most in a dense neighborhood and were recently crafted to address this very type of risk.[254]

2. The Board should order mitigation conditions to address merger-related hazardous materials release risks in Englewood.

Board-ordered mitigation is essential on this topic because Board approval displaces nearly every other source of protection as to hazardous materials. Carriers in an approved transaction are "exempt . . . from all other law, including State and municipal law, as necessary to let [them] carry out the transaction."[255] The federal framework already limits state and local regulation of rail hazmat and relies on voluntary mitigation from carriers.[256] These rules apply uniformly, mostly take effect only after a release, and leave potential hazardous-release-risk-reduction that could be accomplished through routing choices largely up to the carriers.[257]

Most of what rail carriers do to prevent and mitigate hazardous materials releases are voluntary industry standards that appear to have crucial shortcomings. For example, the standard for hazardous material transportation, other than flammable liquids, is the American Association of Railroads' Circular OT-55-R, which provides recommendations for maximum speed, routing, detector spacing, and communication with local emergency responders,[258] but is silent on

[254] *Id.* at 131, 133–36.

[255] 49 U.S.C. § 11321(a).

[256] *See* 49 U.S.C. §§ 5125, 20106(a) (preempting most state and local hazmat and rail safety requirements); 49 C.F.R. § 171.8 (defining "high-hazard flammable train"); Goldman, *supra* note 221, at 3–5 & tbl.1 (explaining that federal high-hazard train requirements apply only to trains carrying large blocks of flammable liquids, while the industry's voluntary "key train" standards cover a broader set of hazmat trains).

[257] *See* 49 U.S.C. § 20106(a)(1) (requiring that rail safety and security rules "be nationally uniform to the extent practicable"); Hazardous Waste Operations and Emergency Response, 29 C.F.R. § 1910.120(q) (2025); National Oil and Hazardous Substances Pollution Contingency Plan, 40 C.F.R. pt. 300 (2025); 49 C.F.R. §§ 171.15–171.16 (incident reporting); 49 C.F.R. § 172.820(a), (e) (requiring carriers of certain hazardous materials to use their own route analyses to "select the practicable route posing the least overall safety and security risk"); *see also* 49 C.F.R. § 209.501(a) (authorizing FRA to require an alternative route only when a carrier's route analysis is deficient).

[258] Ass'n of Am. R.Rs., Circular No. OT-55-R, *Recommended Railroad Operating Practices for Transportation of Hazardous Materials* § I.B, § II.B, § II.B, §§ V–VIII at 1–5 (2019) https://www.aar.org/wp-content/uploads/2024/12/2022-07-01-OT-55-R-CPC-KBD.pdf.

maximum train-length, speed in urban areas, and tank car and braking specifications,[259] despite the fact that the latter factors are also impactful in preventing hazardous material incidents.[260]

Moreover, neither the people of Englewood nor the Board should rely on voluntary pledges that are unenforceable and often turn out to be illusory, as evidenced by NS's espousals after the East Palestine disaster. Following the 2023 East Palestine derailment and hazardous material release, the National Transportation Safety Board investigated NS's conduct and found several lapses that contributed to the incident, including the hot bearing detectors being spaced too far apart, a delay in getting the train consist to emergency responders, and conducting an unnecessary vent and burn.[261] As a result, the NTSB recommended that FRA set binding minimum requirements for detector spacing, alarm thresholds, and railroads' responses to alarms, and it directed four recommendations to NS itself.[262] NTSB recommendations do not carry the force of law, however, and FRA has not yet adopted those rules.[263] Class I Railroads made their own voluntary pledges to the public, such as adding roughly 1,000 detectors toward an average spacing of 15 miles on key routes and joining FRA's Confidential Close Call Reporting System (C3RS).[264]

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[259] *See* Goldman, *supra* note 221, at 3–5 tbl.1 (comparing federal requirements limiting trains to "40 mph in high-threat urban areas unless all tank cars meet or exceed [DOT]-117/117P/117R standards" and requiring that "[b]rakes . . . use a two-way end-of-train device or distributed power" with OT-55 requirements that include neither); *see generally* Ass'n of Am. R.Rs., *supra* note 258 (containing no limits on train length, speed in urban areas, or tank car or braking specifications).

[260] *See* Goldman, *supra* note 221, at 5–6 (explaining that DOT-117 tank cars are "less likely to rupture" and that electronically controlled pneumatic brakes may shorten stopping distances); Liu et al., *supra* note 227, at 449 ("The analysis shows that reducing train speed, improving tank car safety design and changing tank car placement all have the potential to reduce the number of tank cars releasing per derailment. In addition, there are interactive effects among different risk reduction strategies"); Peter M. Madsen et al., *The Relationship Between Freight Train Length and the Risk of Derailment*, 44 Risk Analysis 2616, 2625 (2024) (finding that longer trains are more likely to derail, even after accounting for the fewer trains needed to move the same freight).

[261] Nat'l Transp. Safety Bd., NTSB/RIR-24-05, *Norfolk Southern Railway Derailment and Hazardous Materials Release, East Palestine, Ohio, February 3, 2023*, at 166–70 (2024), https://www.ntsb.gov/investigations/AccidentReports/Reports/RIR2405%20CORRECTED.pdf.

[262] *Id.* at xii, xiii, 176.

[263] *See* 49 U.S.C. § 1135(a) (2024) (requiring the Secretary of Transportation to state whether DOT will adopt all, part, or none of each NTSB recommendation); Goldman, *supra* note 221, at 10–11 ("Federal regulations do not currently require the use of wayside defect detectors . . . .").

[264] Press Release, Ass'n of Am. R.Rs., *Freight Railroads Announce Key Safety Measures in Drive to Zero Accidents* (Mar. 8, 2023), https://www.aar.org/news/freight-railroads-announce-key-safety-measures-in-drive-to-zero-accidents/; *see also* Goldman, *supra* note 221, at 20–21

Yet, three years after the C3RS pledge, no Class I railroad had fully joined: NS has run pilot programs and UP has not joined at all.[265] There is reason to believe NS will implement some version of the recommendation regarding deployment of hot bearing detectors, but only because it was integrated into a legally binding settlement NS entered into with the U.S. Department of Justice and U.S. Environmental Protection Agency. That Consent Decree bound NS to deploy detector at a spacing of no more than 15.05 miles binding across NS's system.[266] What NS promised voluntarily in response to the East Palestine disaster and the NTSB's recommendation has lagged; what enforcement required was delivered, but only within the enforcer's statutory authority in those enforcement cases. The Board's authority to condition approvals as necessary to protect the public is far broader.

This proceeding is the community's most direct mechanism to raise the alarm about increased risks of hazardous material release in Englewood that will accompany merger approval. The Board should heed that call and require mitigation measures as binding conditions of approval, with independent oversight, public reporting, and consequences for noncompliance.

Accordingly, SEI asks the Board to condition any approval on the following requirements on the Applicants:

- **Reroute hazardous materials.** Applicants should develop a study and then implement its findings that, to the greatest extent practicable, identifies how the merged entity could reroute hazardous materials traffic around Englewood , and disclose the Englewood route analysis to the Board, the City of Chicago and other stakeholders.[267]

- **Limit hazmat dwell time.** The Board should include conditions that prohibit or limit the time for storage or staging of loaded hazmat cars or containers in Englewood, cap dwell time, and impose key train operation restrictions, including speed limits, for all hazmat trains through Englewood and other densely populated areas.[268]

("[A]ll Class I railroads signaled their intention to join the program following the East Palestine derailment.")

[265] Fed. R.R. Admin., *Participating Railroads* (Oct. 2, 2026), https://railroads.dot.gov/railroad-safety/partnerships-programs/participating-railroads.

[266] Proposed Consent Decree ¶ 56, *Ohio v. Norfolk S. Ry. Co.*, No. 4:23-cv-00517 (N.D. Ohio lodged May 23, 2024), ECF No. 138-1, https://www.justice.gov/enrd/media/1353111/dl?inline

[267] While Applicants' common carrier obligation means railroads must accept hazmat traffic (49 U.S.C. § 11101(a)), that duty does not dictate the traffic flow through densely populated urban centers. Applicants choose routes, where cars are staged, and how long they dwell, and they can choose not to send hazmat through dense neighborhoods when less populated routes are available. *See* 49 C.F.R. § 172.820(e), (h).

[268] This requirement would extend existing federal standards to all hazardous materials traffic through Englewood. Federal regulations already require carriers to minimize how long certain

- **Invest in rail safety improvements.** Require that the merged entity prioritize future rail safety improvements in high-density and vulnerable populations like Englewood.

- **Truck safety.** Require designated truck routes that keep hazardous material-bearing trucks traveling to or from the 47th Street Yard away from schools, parks, and residential streets. Additionally, require on-site staging instead of street queuing; and gate inspections of hazmat loads.

- **Yard hazmat handling.** Require a hazmat storage area away from the fence line with secondary containment; spill prevention and response plans; spill supplies on site (NS keeps them at only "most" yards)[269]; and require Applicant-run hazmat training for local emergency responders[270] and independent, third-party audits of Applicants' procedures annually with reporting to the Board and public.[271]

- **Emergency preparedness.** Require that Applicants provide funding for City of Chicago first-responders hazardous material response training, equipment, and drills that include Englewood schools and community institutions. Include enforceable, ongoing obligations that NS's RapidSOS notifications and accurate AskRail contacts be kept on Chicago lines.[272] Require that commodity flow data be available to the City of Chicago, with a public summary, and that a community alert and evacuation plan be created, updated, and socialized with local residents and institutions.

- **Implement NTSB East Palestine recommendations.** Require that the merged entity implement all NTSB recommendations.[273] Prohibit the merged entity from making cuts to hazardous material staffing, response assets, or NS's post–East Palestine programs, particularly in the Chicago area, until integration is complete and all safety and hazardous materials-related plans tested, on a fixed timeline reported to the Board.[274]

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hazardous materials are stored in transit. 49 C.F.R. § 172.820(a), (h). The industry's voluntary standards define "key trains" and limit their speed. Ass'n of Am. R.Rs., *supra* note 268, at 1.

[269] SIP, *supra* note 250, at 131.

[270] *See id.* at 130.

[271] *Cf. id.* at 129–30 (describing only internal "Hazmat Checkups" conducted by Norfolk Southern's own hazmat managers).

[272] *See supra* note 254 and accompanying text.

[273] *See* Nat'l Transp. Safety Bd., *supra* note 261, at 172–78.

[274] *See* SIP, *supra* note 250, at 128 (stating that Norfolk Southern "further developed and improved" its hazardous materials programs after East Palestine); *id.* at 132–34 (anticipating that NS's hazmat staff, inspection program, training equipment, and emergency response assets will be folded into UP's programs, and that staffing levels and asset coverage will be reviewed).

- **Monitoring and reporting.** Proved for an independent monitor to oversee Applicants' compliance with Board conditions; require annual public reports including information required in relation to preceding mitigation conditions, such as Englewood hazardous material volumes, incidents, non-accident releases, and 47th Street Yard hazardous material staffing, training and policy changes. The Board should retain jurisdiction to add conditions or otherwise ensure compliance with all conditions.

With the increases in freight traffic that the Proposed Transaction will cause in Englewood, some merger-driven hazardous material risk cannot be conditioned away, and the Board must account for it in its overall public-interest balancing. The above mitigation measures can reduce the incidence of chronic contamination and reduce the burden on Englewood in the case of an acute release. However, though catastrophic releases are rare, they are also unpredictable, and no condition can eliminate entirely their risk. Applicants may urge the Board to discount this risk because a catastrophic release is unlikely in any given year. The Board should decline. An analysis that counts only the expected number of releases per year considers likelihood but not consequence. Although it can be "extremely difficult . . . to know the full extent of risk of high-cost, low-probability disasters[,]" nevertheless, the Board must recall that [r]isk is "the probability of an incident occurring (chlorine gas escaping, ethanol igniting, etc.) multiplied by the expected consequence of that incident."[275] To consider risk, then, the Board must consider the scale of the consequence in addition to the probability of an incident, where that probability will rise due to the added trains, trucks, lifts, and dwell time the Proposed Transaction would bring to Englewood. The Board must weigh this hefty risk heavily against the benefits Applicants claim.

E. Land & Water Contamination

1. Harms from soil and water contamination will increase as a result of the merger.

The Proposed Transaction will increase the risk of soil and water contamination in Englewood as a function of the increased rail, truck and yard activity at the 47th Street Yard, creating public-interest harms the Board must weigh.

Railroad operations are a primary source of soil and water pollution. Abrasion from wheels against rails releases heavy metals, and polycyclic aromatic hydrocarbons ("PAHs") are released from diesel locomotives and wooden crossties; these pollutants initially accumulate near tracks, but rainwater runoff carries them into a track's drainage system and beyond to

[275] Pipeline & Hazardous Materials Safety Admin., *supra* note 242, at 46, 36.

neighboring land and surface waters.[276] Heavy metals are found in elevated concentrations in water, soil, and biota associated with railroads.[277]

Railyards in particular are a significant source of pollutants that can impact surface water, stormwater, and soil: "Fuels, oils, and lubricants enter the environment through leakage from storage tanks, filling stations, locomotives, and accidental spills. Risks are exacerbated by using diesel locomotives (often as switch engines) . . . . Oils and greases are widely applied to gears, switches, and engines," and routine maintenance operations "release oils, greases, solvents (chlorinated and non-chlorinated), phenols, antifreeze, detergents, sewage waste, PAHs [polycyclic aromatic hydrocarbons], and inorganic substances."[278] Locomotives are fueled and serviced at railyards, which produces regular releases at a fixed location. Releases occur from overfills while fueling, cracked fuel lines, punctured fuel tanks, and overflow of fuel storage during heavy rain.[279] Spilled fuel oil can be carried by stormwater, migrate into groundwater, persist in soil for more than a decade, and send vapors into nearby basements; children may be exposed through contaminated soil.[280]

Polluted stormwater runoff is of particular concern near railyards, which are labelled as "stormwater pollution hotspots."[281] Effective stormwater management is essential at railyards to prevent polluted runoff from leaching contaminants into local groundwater and surrounding soil or from entering local stormwater sewer systems,[282] from where it can find its way into homes during flooding events. The collection of rail runoff in the local sewer system is of particular concern in Chicago, where the combined sewer system is often overwhelmed during rain events causing backups into residential basements.[283] This means that when rain falls on the 47th Street Yard, it will carry pollution from merger-related increased operations into sewers, which can

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[276] Jiri Marsalek et al., *Water and Soil Pollution from Rail Transportation: State of Knowledge and Environmental Concerns*, 237 Water Air Soil Pollution 1118 (2026).

[277] Boguslaw Wilkomirski et al., *Railway Transportation as a Serious Source of Organic and Inorganic Pollution*, 218 Water Air Soil Pollution 333 (2011).

[278] Marsalek et al., *supra* note 276.

[279] ICC 2025 Report tbl. C.

[280] Agency for Toxic Substances & Disease Registry, U.S. Dep't of Health & Hum. Servs., *Public Health Statement for Fuel Oils* (1995).

[281] *Id.*

[282] *Id.*

[283] *See, e.g.*, City of Chicago, *Water Management—Basement Flooding,* https://www.chicago.gov/city/en/depts/water/supp_info/basement_floodingpartnership.html; Chicago Department of Environment, *City of Chicago Green Infrastructure Strategy*, at 19-23 https://news.wttw.com/sites/default/files/article/file-attachments/Chicago%20Green%20Infrastructure%20Strategy%20-%20May%202026.pdf. The Center of Neighborhood Technology's Urban Flooding Baseline Tool shows that 51% of properties in Englewood are at risk of flooding. https://ufb.cnt.org/map/?community=South%20Chicago.

then directly enter people's homes. Indeed, homes in Englewood experience residential flooding at nearly twice the rate of the City of Chicago in general.284

The health effects of these contaminants are "well documented."[285] PAHs, for example, are known carcinogens. While most damage from PAHs occurs via inhalation, PAHs evaporate from surface soil to the air, and interaction with contaminated soil or water is a known route for the chemicals to enter the body.[286] Meanwhile, heavy metals like lead and cadmium contribute to a host of health issues, and lead-contaminated soil is known to contribute to high blood lead levels for children.[287] With an increase in railroad operations in Englewood, the community can expect an increase in local PAH and heavy metal contamination, and an increase in the associated health risks: asthma, heard disease, COPD, lung cancer, among others.

2. These harms may be mitigated consistent with the Board's previous approvals.

While the Proposed Transaction may or may not bring benefits at the scale of the national freight system, the increases it will cause in rail and truck traffic in Englewood will lead to an increase in soil and water contamination in the community, and the resulting, well-documented health risks of that contamination. As previously mentioned, under the heightened public interest standard to which this merger is held, the Board must mitigate local harms where possible. Accordingly, SEI requests the below mitigation measures, which are consistent with the public interest standard and previous Board merger approvals.

To mitigate the soil and water contamination associated with railway operations at the 47th Street Yard, SEI requests that the Board require:

- **Stormwater Pollution Prevention Plan.** Develop a site-specific Stormwater Pollution Prevention Plan which will incorporate site specific measures to control erosion and reduce the amount of pollutants entering the community and that requires robust monitoring of stormwater exiting the 47th Street Yard via runoff, sewer discharge, or otherwise.[288]

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[284] *Chicago Health Atlas: Englewood*, *supra* note 14 (Residence flooding, past year rate: 45.8% of Englewood adults experienced residential flooding the past year, against 23% in Chicago as a whole).

[285] J.M. Levengood et al., *Polyaromatic Hydrocarbons and Elements in Sediments Associated with a Suburban Railway*, 187 Environmental Monitoring & Assessment 534 (2015).

[286] ATSDR, Public Health Statement for Polycyclic Aromatic Hydrocarbons (PAHs), https://wwwn.cdc.gov/tsp/PHS/PHS.aspx?phsid=120&toxid=25.

[287] American Academy of Pediatrics, *Prevention of Childhood Lead Toxicity*, 138 Pediatrics 1 (2016).

[288] CP–KC Decision at 208 (VM-Water-05).

- **Remediation funding.** Commit funds to the remediation of residential properties, vacant lots and other properties land near the 47th Street Yard, which can be administered through the Community Mitigation Fund.

- **Response planning.** Develop a site-specific spill prevention, control and response plan that will specify measures to prevent the release of gasoline, diesel fuel, oil, lubricants, petroleum products, or other hazardous materials and contain such discharges if they occur.[289]

- **Clean-up and notification.** Require Applicants to promptly clean up any gasoline, diesel fuel, oil, lubricant, petroleum product, or hazardous material spills and notify responsible agencies in accordance with federal and state regulations.[290]

- **Inspections.** Require Yard operators to conduct daily inspections of all equipment for any fuel, lube, oil, hydraulic or antifreeze leaks during regular operations. If leaks are found, to immediately remove the equipment from service and repair or replace it.[291]

VI. Conclusion

The potential benefits of the Proposed Transaction that Applicants tout are national and diffuse, in contrast to the concentrated local harms that it would impose on the Englewood community in Chicago. Applicants have largely ignored these local impacts, but the Board's statutory mandate requires it to consider local harms and empowers it to require Applicants to implement mitigation measures as part of any order approving the Proposed Transaction. Accordingly, in the event that the Board does approve the Proposed Transaction, SEI respectfully requests that the Board's order:

- **Impose the specific mitigation measures identified in Section V** as to each category of harm that the Proposed Transaction will impose on Englewood, including:
    - Accessibility, mobility, and local transportation measures (Section V.A.2)
    - Noise and vibration measures (Section V.B.2(a)).
    - Light and heat measures (Section V.B.2(b)).
    - Air quality measures (Section V.C.2(c)).

[289] CP–KC Decision at 205 (VM-Haz. Material Sites-02); CP–KC Decision at 205 (VM-Haz. Material Sites-04).

[290] *Id.*

[291] CP–KC Decision at 209 (VM-Water-11).

- Hazardous materials measures (Section V.D.2).
- Land and water contamination measures (Section V.E.2).

- **Establish a Community Mitigation Fund**, paid into by Applicants and administered by Englewood residents and local officials (or at a minimum with the structured, meaningful direction of Englewood residents and local officials), through which the measures above and other community-directed mitigation of the transaction's residual local harms may be funded and carried out. Funding from Applicants should reflect anticipated types of harm described above and be structured as lump sum allocations corresponding to those harms alongside a per-truck fee structure.

- **Require Applicants to engage local stakeholders** by hosting annual or more frequent tours of the 47th Street Yard and recurring meetings with local stakeholders—including Englewood schools, church and community groups, local industry representatives, as well as City, State and other government officials—to both view conditions at the yard and provide a forum to resolve community impacts issues. Applicants should also be required to consult with relevant stakeholders before selling or redeveloping yards in Chicago that are idled as a result of the Proposed Transaction (as addressed above in Section V, page 18).

- **Provide for continued oversight of Applicants' compliance with mitigation**. No matter the other conditions imposed, the Board should require a lengthy reporting, monitoring, and Board oversight period to ensure Applicants' compliance with approval conditions. Given that Applicants have expressed reluctance, even at the application stage, to meaningfully engage on the issue of mitigation conditions,[292] there is reason to expect that they may be equally reticent to comply with mandatory mitigation obligations imposed by the Board.[293]

Applicants ask the Board for approval to fundamentally change foundations of our national economy. In weighing all of the various interests and perspectives on our national freight system from every corner of the nation's economy and geography, the Board cannot forget that this nationwide system only works to our collective benefit because specific places throughout our country absorb the environmental, public health, and quality of life costs. Englewood is just such a place, and SEI respectfully requests that the Board consider seriously

[292] *Union Pac. Corp.—Control—Norfolk S. Corp. (Decision No. 21)*, FD 36873, slip op. at 19 (STB served May 28, 2026) (Board "troubled by comments highlighting Applicants' purported unwillingness to engage in discovery").

[293] *See* CN–EJE Decision No. 16 at 39 (imposing a five-year reporting/monitoring condition); CP–KC Decision No. 35 at 142 (imposing seven-year oversight period and retaining jurisdiction to extend).

its people and the price they will pay if freight activity in their community grows as projected under the Proposed Transaction.

Dated: November 18, 2026

Respectfully submitted,

/s/ Robert Weinstock

/s/ Purba Mukerjee

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Attachment A

To: Robert Weinstock & Purba Mukerjee, Counsel for Sustainable Englewood Initiatives

From: Sam Dulin, Cal Skiles, and Pablo Durango-Cohen (Northwestern University, Department of Civil and Environmental Engineering)

Date: November 18, 2026

Re: STB Docket No. 36873: Rail Traffic Near Englewood After the UP–NS Merger

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Summary

Sustainable Englewood Initiatives (SEI), a party to the proceeding reviewing the proposed acquisition of Norfolk Southern by Union Pacific (STB Finance Docket No. 36873), asked the research group of Professor Pablo Durango-Cohen in the Northwestern University McCormick School of Engineering to review the merger application, supporting materials, and other information developed to evaluate how the merger will impact rail traffic and shipping activity in Englewood. The Durango-Cohen group develops and analyzes optimization and econometric models to study management and operation of transportation systems.

We model how the proposed merger of Union Pacific (UP) and Norfolk Southern (NS) would change freight traffic in Chicago, with a focus on the NS 47th Street intermodal terminal and the Englewood community next to it. The model is a national freight network equilibrium in which shippers choose between truck, rail intermodal and rail carload, and in which busy rail lines and terminals become congested. We compare a pre-merger scenario, approximating 2025 activity, with a post-merger scenario, approximating 5 years post-merger. The post-merger scenario accounts for (1) the merger, with UP and NS operating as one railroad; (2) intermodal yard consolidation; (3) 6.6% baseline traffic growth from 2025 to 2030; and (4) the resulting truck-to-rail diversion of about 2.2%, where the diversion rate is an estimate from the model based on 2030 demands.

After the merger, intermodal tonnage handled at 47th–55th Street rises by about 26%, and all rail freight passing the yard by about 36%. On the three line segments around the yard reported in the merger filing, rail ton-miles rise by about 35%; on the stretches of those segments inside Englewood, by about 43%. Where comparable, these results are close to the applicants' own estimates.

1 Background

UP and NS are the largest railroads in the western and eastern United States, respectively, and meet in Chicago. Freight moving between them today is handed from one railroad to the other ("interline" traffic), which adds cost and delay. A merger would turn this traffic into single-

line service and, as described in the Operating Plan, consolidate Chicago intermodal (container and trailer) work at two terminals: UP Global 2 and NS 47th Street. The second of these borders the Englewood community on Chicago's South Side. This report estimates how freight volumes at that terminal and on the rail lines around it would change, and how much of that change falls inside Englewood.

Places and terms used in this report

- **UP Global 2:** Union Pacific's large rail yard and intermodal terminal in Chicago's western suburbs (Northlake, Illinois).
- **UP Yard Center:** a smaller Union Pacific intermodal terminal in Chicago's southern suburbs (Dolton, Illinois).
- **NS 47th–55th Street:** Norfolk Southern's intermodal terminal on Chicago's South Side, which runs along the tracks between 47th Street and 55th Street (Garfield Boulevard), on the northern edge of Englewood. NS operates it as two adjoining facilities, named after those streets; we treat them as one terminal.
- **NS 63rd Street:** a smaller Norfolk Southern intermodal terminal near 63rd Street, just south and east of the 47th–55th Street terminal. Under the merger plan its work moves elsewhere.
- **CP 502, CP 518:** "control points", railroad signal locations that are identified by number and used in the merger filing to mark the ends of the line segments it reports. 47th St–CP 502 is the Norfolk Southern main line running southeast from the yard towards Indiana; CP 518–47th St is the short stretch just north of the yard.
- **Metra SouthWest line**: the rail line (Metra's SouthWest Service) that runs north–south through Englewood just west of the yard. Norfolk Southern freight trains also use part of it.
- **Englewood:** one of Chicago's 77 official community areas, using the City of Chicago's boundary (Chicago Data Portal, https://data.cityofchicago.org/Facilities-Geographic-Boundaries/Boundaries-Neighborhoods/bbvz-uum9).
- **Intermodal:** freight moved in shipping containers or truck trailers that are lifted between trucks and trains at a terminal.
- **Carload:** freight moved in ordinary rail cars (e.g. grain, chemicals, coal).
- **Interline:** freight that starts on one railroad and finishes on another, so it has to be handed over between them.
- **Ton-miles:** tons of freight multiplied by the miles it travels; a standard measure of how much freight moves over a stretch of track.

- **Merger filing:** the application UP and NS submitted to the Surface Transportation Board, the federal agency that reviews railroad mergers.

2 Methods

The analysis builds on a national multimodal freight network model, INTERMODAL, previously developed by Northwestern University (Pablo Durango-Cohen; Hani S. Mahmassani, formerly) and Vanderbilt University (Craig Philip, Hiba Baroud, Ahmad Taha and Paul Johnson), with funding from ARPA-E's INTERMODAL program. . As described below, the existing model supplied the rail network data, freight demand inputs, and cost, time and emission parameters. For this study it was extended to represent UP and NS as separate railroads, shippers' choice between truck and rail, congestion at terminals and on rail lines, and pre- and post-merger scenarios.

2.1 Rail Network Data and Demand Inputs

This analysis builds on IMAGINED (Intermodal Analytics for Global Infrastructure Network Energy Dynamics), a project led by the Northwestern University Transportation Center with Vanderbilt University and funded by the U.S. Department of Energy's ARPA-E under its INTERMODAL program. IMAGINED developed a set of tools for analyzing the U.S. multimodal freight system, including freight flow forecasts, route planning, terminal location optimization and energy technology deployment on rail networks. This study builds most directly on its network optimization tool, which represents freight moving between FAF regions over truck, rail and waterway networks and selects the terminals and routes that minimize total system cost. From IMAGINED, this study takes the terminal locations, freight demand inputs, and cost, time and emission parameters. It extends that work in a few ways: it adds Norfolk Southern to the rail network; it uses a nested choice model that spreads freight across truck, intermodal and carload according to relative cost; it calibrates to observed rail shares; and it represents the UP–NS merger. The rail network comes from the Federal Railroad Administration's North American Rail Network. Where UP and NS track meet, the model adds an interchange link between them. Intermodal terminal locations on UP and NS track come from the IMAGINED terminal data.

The four Chicago intermodal sites studied here (UP Global 2, UP Yard Center, NS 47th–55th Street and NS 63rd Street) are identified from the yard names in the FRA data. Freight flows come from the Freight Analysis Framework (FAF, version 5.6.1): annual tons moved between FAF regions by commodity and mode. The FAF is a federal freight forecast produced by the Federal Highway Administration and Bureau of Transportation Statistics, and it is the standard federal baseline in freight planning. We use truck, rail and multiple-mode flows between different regions. The pre-merger scenario uses 2025 demand and the post-merger scenario 2030 demand based on FAF forecasts, interpolated linearly between published years where needed. The FAF projected baseline growth from 2025 to 2030 is about 6.6% or about

1.3% per year. The post-merger scenario also included 2.2% truck-to-rail diversion, which the model approximated based on 2030 demand. Commodities are grouped into three classes k by value of time: high ($\text{VOT}_k = \$21$ per ton-hour), moderate ($12) and low ($0.70).

2.2 Cost functions

The cost functions below set out the cost and time of each option: truck, intermodal and carload. The model is calibrated to the baseline by adjusting shippers' preference for rail until modeled rail shares match observed FAF shares. These preferences are then held fixed, and the model projects how shippers respond when the merger changes costs and terminal locations. Every option is described by a generalized cost per ton: money cost plus travel and waiting time valued at the class's value of time.

The cost and time parameters used below come from three sources: the IMAGINED model on which this study builds, published data on rail operations, and assumptions made for this study. From IMAGINED come the values of time ($21, $12 and $0.70 per ton-hour for high-, moderate- and low-value freight), truck and rail fuel costs, truck origin handling time, and the intermodal terminal lift charge and dwell time. Train service speeds of 30 mph for intermodal and 20 mph for carload follow the weekly performance data UP and NS report to the Surface Transportation Board (EP 724), which show intermodal trains averaging roughly 27–31 mph and manifest trains roughly 18–22 mph. The 24-hour delay for moving freight between UP and NS is comparable to the time carload freight takes to pass through the Chicago Terminal, where eastern and western railroads interchange: about 27 hours under 2016 conditions, according to the Chicago Metropolitan Agency for Planning (CMAP), whose regional targets are 27 hours by 2025 and 24.5 hours by 2050. The 22 hours of carload dwell at each end is likewise comparable to the 22-hour yard dwell CMAP assumes, based on recent observations.

Moving freight between UP and NS track adds $14 per ton and 24 hours. The cost is based on Union Pacific's statement, citing a study by Oliver Wyman, that an interline move costs on average 35% more than a comparable single-line move (Union Pacific 2026). Applied to the rail line-haul cost of a 1,000-mile move (about $0.04 per ton-mile), this gives about $14 per ton.

The congestion function uses the standard Bureau of Public Roads form. Two elements follow the merger application: the intermodal market cutoff, under which a terminal pair is usable only if door-to-door intermodal distance is at most 1.57 times truck distance, and the "lookalike" approach, under which formerly interline lanes take on the rail share of comparable single-line lanes.

The remaining values are assumptions of this study: the truck and rail line-haul rates, the drayage and carload switching charges, track capacity, terminal capacities and tons per lift. They are meant to capture the broad cost structure of each option rather than any particular shipper's price: rail is cheaper per mile but slower, intermodal adds a terminal stop at each end, and an

interline move adds a hand-off between railroads. Two features of the model limit how much these assumed values drive the results. First, the model is calibrated so that baseline rail shares match observed FAF shares, which absorbs differences in the overall level of rail versus truck costs; the results therefore depend mainly on how costs change between scenarios rather than on their absolute levels. Second, terminal capacities matter only relative to one another, since all capacities are scaled by one factor so that baseline terminals together operate at 60% of capacity.

Truck.

For origin o and destination d,

$$C^{T}_{od,k} = (r_T + f_T)\, d_{od} + \mathrm{VOT}_k \left(\frac{d_{od}}{v_T} + h_T \right),$$

with rate $r_T = \$0.12$ and fuel $f_T = \$0.025$ per ton-mile, speed $v_T = 50$ mph, handling time $h_T = 4$ h, and road distance d_{od} equal to 1.3 times the straight-line distance.

Rail line-haul.

Each rail link e of length m_e costs

$$C^{R}_{e,k} = (r_R + f_R)\, m_e + \mathrm{VOT}_k\, t_e(x_e), \qquad t_e(x_e) = t^0_e \left[1 + \alpha \left(\frac{x_e}{c_e} \right)^{\beta} \right],$$

with rate $r_R = \$0.03$ and fuel $f_R = \$0.010$ per ton-mile. The travel time t_e grows with the annual tonnage x_e on the link relative to its capacity c_e (60 million tons per year per main track), following the Bureau of Public Roads form with $\alpha = 0.15$ and $\beta = 4$. Free-flow times use 25 mph; intermodal and carload shipments are further adjusted to service speeds of 30 and 20 mph. Rail routes are the least-cost paths $\mathrm{SP}_k(i, j)$ between points i and j on the network. Moving from UP to NS track (or the reverse) adds \$14 per ton and 24 hours, based on UP estimates from 2026.[1]

Intermodal terminals.

Passing through terminal h costs

$$C^{H}_{h,k} = \ell + \mathrm{VOT}_k \cdot 12\,\mathrm{h} \left[1 + \alpha \left(\frac{v_h}{\kappa_h} \right)^{\beta} \right],$$

a lift charge $\ell = \$1.62$ per ton plus 12 hours of dwell, which grows with the terminal's annual tonnage v_h relative to its capacity κ_h. Capacity is entered as annual lifts. UP Global 2 capacity (750,000) and NS 47th Street capacity (700,000) were based on Applicants' reported capacity in

[1] *Candid Insights: Union Pacific and Norfolk Southern CEOs Outline How a Transcontinental Railroad Will Transform U.S. Freight*, Union Pacific, https://www.up.com/news/growth/transcontinental-railroad-transforms-freight-260310.

lifts/day in their Service Assurance Plan.[2] Annual capacity estimates for other yards, including NS 63rd Street (350,000), UP Yard Center (300,000) and other terminals were based on publicly available data. These capacities were converted at 15 tons per lift, and scaled by one factor so that pre-merger terminals run at 60% of capacity overall.

Rail intermodal.

A shipment through origin terminal h_1 and destination terminal h_2 costs

$$C^{IM}_{od,(h_1,h_2),k} = \text{dray}(o, h_1) + C^{H}_{h_1,k} + \text{SP}_k(h_1, h_2) + C^{H}_{h_2,k} + \text{dray}(h_2, d),$$

where each drayage (truck) leg costs $4 per ton plus the truck cost per mile. At each end of a shipment, the model considers up to six of the nearest intermodal terminals within 150 miles; the 150 miles is a limit on how far a container is trucked to or from a terminal, not a spacing between terminals. Every pairing of an origin-side terminal with a destination-side terminal is then costed in full: the truck trip to the first terminal, the lifts and dwell at both terminals, the rail haul between them along the cheapest route, and the truck trip from the second terminal. Pairs whose door-to-door distance exceeds 1.57 times the truck distance are excluded, following the merger application. The remaining pairs share the shipment according to cost, so most of the freight goes to the cheapest pairs, usually the nearest terminals on a direct rail route. This reflects how intermodal works in practice: containers are trucked a short distance to a nearby terminal and carried the long-haul portion by rail.

Rail carload.

Carload shipments run between the nearest UP or NS access points to the origin and destination:

$$C^{CL}_{od,k} = a_{o,k} + \text{SP}_k(\text{acc}_o, \text{acc}_d) + a_{d,k},$$

where each end a includes $3 per ton and 22 hours of switching and dwell. Regions more than 100 miles from UP or NS track have no carload option.

2.3 Choice model

Choices follow a nested logit model. Within intermodal, shipments divide among terminal pairs:

$$P\big((h_1, h_2) \mid IM\big) = \frac{\exp\big(-\theta_h C^{IM}_{(h_1,h_2)}\big)}{\sum_{(h_1',h_2')} \exp\big(-\theta_h C^{IM}_{(h_1',h_2')}\big)}, \qquad C^{IM}_{od,k} = -\frac{1}{\theta_h} \ln \sum_{(h_1,h_2)} \exp\big(-\theta_h C^{IM}_{(h_1,h_2)}\big).$$

The composite intermodal cost $C^{IM}_{od,k}$ then competes with truck and carload:

$$P(m) = \frac{\exp\big(-\theta_k C^{m}_{od,k} + \beta_{m,k} + \delta_g\big)}{\sum_{m'} \exp\big(-\theta_k C^{m'}_{od,k} + \beta_{m',k} + \delta_g\big)}, \qquad m \in \{T, IM, CL\},$$

[2] Rev. App. 2-889, Turner V.S. at 37, Table 10 & 11.

where the cost sensitivity θ_k equals 5 divided by the class's median truck cost, $\theta_h = 3\theta_k$, $\beta_{m,k}$ is a calibrated constant for the rail options, and δ_g is the merger adjustment described below (zero for truck and before the merger). This spreads freight over options in proportion to how attractive they are, rather than assigning every shipment to the single cheapest option.

2.4 Equilibrium and calibration

Because congestion depends on flows and flows depend on congestion, the model is solved iteratively with the method of successive averages: costs are computed from current flows, shippers choose, and the new flows are averaged with the old, until the relative change falls below 0.1% or after 40 iterations. The rail constants $\beta_{m,k}$ are calibrated in the pre-merger scenario so that the model's rail share for each commodity class matches the FAF rail share, and are held fixed in the other scenarios.

2.5 Scenarios

- **Pre-merger:** all four Chicago sites handle intermodal traffic; UP and NS are separate.
- **Post-merger:** intermodal handled only at UP Global 2 and NS 47th–55th Street, and UP and NS operate as one railroad; estimate 2.2% truck-to-rail diversion; project 6.6% baseline traffic growth from 2025 to 2030, from FAF projections; the interchange cost and delay are removed. In addition, lanes that were interline receive an adjustment $\delta_g \geq 0$, solved for each commodity class and distance band g, so that their rail share matches that of comparable single-line lanes.

2.6 Measures

- **Intermodal tons:** tons lifted between truck and train at a terminal.
- **Rail tons through the yard:** all rail freight passing the yard location, including through trains, carload and intermodal.
- **Segment ton-miles:** for a line segment, $\sum_e x_e\, m_e$ over its links (both directions). The two NS segments (47th St–CP 502 and CP 518–47th St) are traced as the shortest path on NS track between their end points; the third is the stretch of Metra's SouthWest line, on which NS operates under trackage rights, connected to the yard and within two miles of it. Segment ton-miles are added before the percentage change is taken.
- **Ton-miles inside Englewood:** the same sum, counting only the share of each link that lies inside the Englewood community boundary (as defined in the City of Chicago Data Portal); a second version extends the boundary straight north to 47th Street to include the area around the yard.

3 Results

3.1 The 47th–55th Street terminal

Table 1. NS 47th–55th Street, model estimates.

	Pre-merger	Post-merger	Change
Intermodal tons (thousand/yr)	18,716	23,638	+26.3%
Rail tons through yard (thousand/yr)	28,535	38,892	+36.3%

After the merger, intermodal tonnage handled at 47th–55th Street rises by 26.3%, as work from 63rd Street and Yard Center moves to the remaining terminals and interline traffic becomes single-line (Table 1). All rail freight passing the yard rises by 36.3%, more than intermodal alone, because the merger also adds through traffic that no longer changes railroads in Chicago.

3.2 Rail lines around the yard

Table 2. Change in rail ton-miles on the three line segments around the yard, post- vs. pre-merger.

Segment	Track-miles	Change in rail ton-miles
47th St – CP 502	16.6	+33.9%
CP 518 – 47th St	1.3	+47.0%
Metra SouthWest (near the yard)	3.7	+43.3%
Three segments combined	21.6	+35.7%

On the line segments around the yard (10058-CHICAGO LINE, 12307-OTHER CD518_NS – CD517_NS, 12755-OTHER CD517_NS - 066262_NS), rail ton-miles rise by 33.9% on the main segment (47th St–CP 502) and by 47.0% on the short segment north of the yard (CP 518–47th St) (Table 2, Figure 1). On the stretch of Metra's SouthWest line near the yard, they rise by 43.3%. Combined, rail ton-miles on the three segments rise by 35.7%. On the main segment this corresponds to roughly five to six additional loaded trains per day, both directions combined, assuming about 4,000 net tons per train.

3.3 Inside Englewood

These estimates come from the same pre- and post-merger model runs as the other results; no separate scenario was run. The model reports the annual tonnage carried on every link of the rail network. We overlaid the City of Chicago's Englewood neighborhood boundary on the network, cut each link of the three segments at the boundary, and kept only the track inside it.

Rail ton-miles inside Englewood are the tonnage on each piece multiplied by its length inside the boundary, summed over all pieces. The percent change compares these totals between the two runs. For the extended version, the boundary's northern edge was moved north to 47th Street (about one mile), and the same calculation was repeated.

The size of the change depends on which track is counted. Taken over their full lengths (21.6 track-miles; Figure 1), rail ton-miles on the three segments rise by about 36%. Counting only the stretches that lie inside Englewood, the increase is larger: 43.7% using the City of Chicago's neighborhood boundary (3.2 track-miles; Figure 2), and 42.8% when the boundary is extended about one mile north to 47th Street (5.3 track-miles; Figure 3). The extension adds the north end of the yard area and the short CP 518–47th Street segment, which lies just outside the city's boundary. The increase is larger inside Englewood because this track sits next to the yard, where the added intermodal traffic enters and leaves the network. Farther out, the segments also carry through traffic that the consolidation affects less, which dilutes the percent change over the full segment length. The two boundary versions give nearly the same result, so the estimate is not sensitive to exactly where the northern edge is drawn. The full-segment figure averages the change over long stretches of line, much of them outside Englewood; the community figure counts only track inside the neighborhood. Both are correct for what they measure, but they describe different areas.

3.4 Comparison with Applicants' Projections

We compare our estimate for the 47th Street Yard with Applicants' Master Data Table, projecting a 26.6% increase in truck traffic at the facility from 2025 to 2030. Our model estimates a 26.3% increase in intermodal tonnage handled at the terminal from 2025 to 2030. These measures are comparable because each container lifted carries a roughly fixed amount of freight and is moved to or from the terminal by truck, so tonnage, lifts and truck trips change in roughly the same proportion. For rail ton-miles on the three segments combined, ours (about +35%) is similar to the filing's (about +31%). The methods differ (the filing reflects the applicants' operating plan, base year and gross ton-miles), but the estimates agree in direction and approximate size. The filing does not report neighborhood-level figures.



Figure 1. The three line segments around NS 47th–55th Street, as traced on the model's network: 47th St–CP 502, CP 518–47th St, and the nearby stretch of Metra's SouthWest line. Combined, rail ton-miles rise by about 35% after the merger.

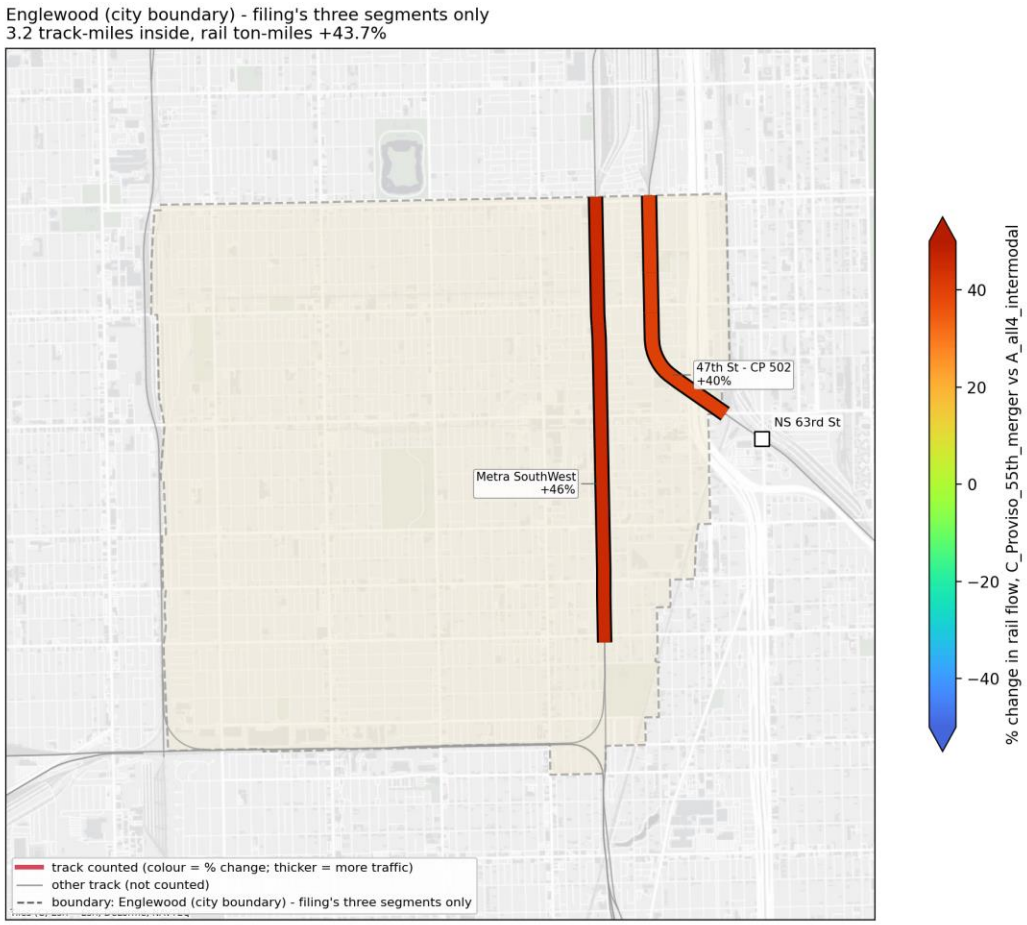

Figure 2. The three segments, counting only the track inside the Englewood community boundary (city boundary; 3.2 track-miles). Colour shows the change in rail flow post- vs. pre-merger; thicker lines carry more traffic. Rail ton-miles inside rise by 43.7%.

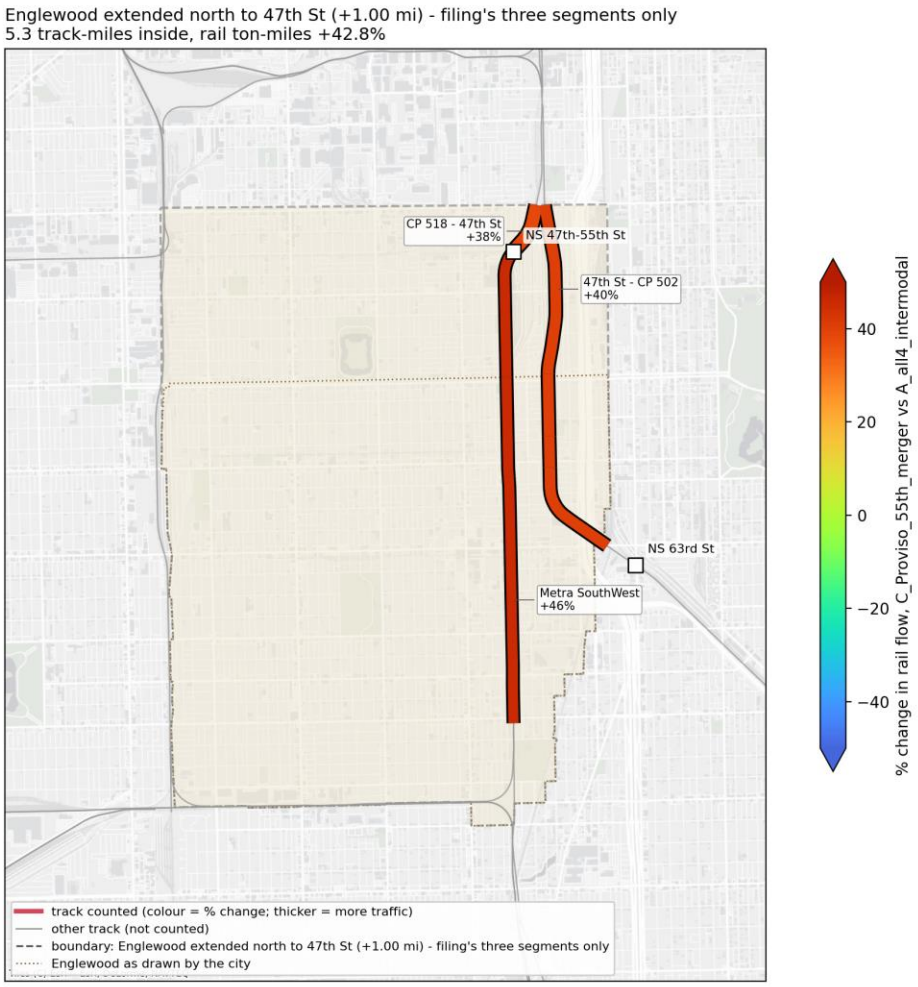

Figure 3. As Figure 2, with the boundary extended straight north to 47th Street to include the area around the yard (5.3 track-miles). The dotted line is the city's boundary. Rail ton-miles inside rise by 42.8%.

4 Limitations

First, the model represents only UP and NS track. BNSF, CSX, CN and CPKC, which also carry substantial traffic through Chicago, are not included, and the model does not represent the passenger schedules or trackage-rights agreements that limit freight on shared lines such as Metra's SouthWest line. In practice, shippers can choose other railroads, and part of the merger's expected effect is traffic shifting to the combined railroad from those railroads; the model captures only shifts between truck and UP/NS rail. Because the model is calibrated to total rail shares, which include all railroads, UP/NS volumes may also be overstated where other railroads carry much of the traffic. Estimates of freight on that line are therefore best read as an upper bound. This limitation, however, does not significantly affect activity estimates related to the 47th Street terminal, because it handles only NS traffic.

Second, Trucks are not routed on the road network: truck distances are scaled straight-line distances between FAF regions, which are large, so local truck patterns are not represented in detail.

Third, the results count freight tons only; measures that include the weight of the rail cars (gross ton-miles) tend to rise somewhat more when intermodal traffic grows. Absolute tonnages are model estimates, and the percentage changes are the more reliable result. The conversion to trains per day is a rough illustration, not a model of train operations. Rail ton-miles also leave out yard activity (idling, switching, lift equipment, stopped trains) and drayage trucks, which can be significant near a busy terminal. Finally, several inputs, including rates, the interchange cost, terminal capacities and the cost sensitivity of shippers, are assumptions, so the results are best read as estimates of the direction and approximate size of the changes.

5 Conclusions

In our model, the merger and the concentration of Chicago intermodal work at UP Global 2 and NS 47th–55th Street increase intermodal tonnage at 47th–55th Street by about 26%, and all rail freight passing the yard by about 36%. On the three line segments around the yard, rail ton-miles rise by about 35%, roughly five to six more loaded trains a day on the main segment.

The increase is larger on the stretches of those segments inside Englewood, about 43%, than when it is averaged over their full length. Corridor-level and neighborhood-level measures are therefore complementary: assessing effects on a specific community benefits from measures drawn around that community. Where our estimates can be compared with the applicants' own figures, they are close.

Attachment B

To: Robert Weinstock & Purba Mukerjee, Counsel for Sustainable Englewood Initiatives
From: Northwestern University McCormick School of Engineering's Mobility and Behavior Lab
Date: November 18, 2026
Re: STB Docket No. 36873: Englewood/47th Street Yard Truck and Freight-Related Crash Analyses

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Introduction

Sustainable Englewood Initiatives (SEI), a party to the proceeding reviewing the proposed acquisition of Norfolk Southern by Union Pacific (STB Finance Docket No. 36873), asked the Mobility and Behavior Lab, led by Professor Amanda Stathopoulos, in Northwestern University McCormick School of Engineering's Department of Civil and Environmental Engineering to review the merger application, supporting materials, and other information developed in the proceeding in order to analyze how projected changes in truck traffic that result from the proposed merger will impact road safety and community mobility concerns in the Englewood community of Chicago. Using police-reported crash records for all of Chicago from January 2021 through early November 2026, we: (1) compare heavy-duty vehicle (HDV) and freight-related crashes (crashes that are highly likely to be related to yard operations, under criteria defined below) and related injuries in Englewood with surrounding neighborhoods and the rest of the city; (2) identify where these crashes occur within Englewood; (3) test explanations for why truck crashes in Englewood injure more people than elsewhere; and (4) estimate how these metrics would change if the merger proceeds as the Applicants project.

This memorandum presents the Lab's findings and explains our methodology. The analysis was led by PhD candidate Nathan Blum*, with support and oversight from William Patterson Junior Professor Amanda Stathopoulos of the Department of Civil and Environmental Engineering. The analysis was further supported by activity data developed by Samuel Dulin, a PhD candidate working under the supervision of Professor Pablo Durango-Cohen, also of the Department of Civil and Environmental Engineering. As detailed in the memorandum provided by the Durango-Cohen Group, the activity data from the Durango-Cohen Group was based on their review, on behalf of SEI, of the merger application and supporting information, as well as their independent analyses of how the Applicants' planned operational changes will affect freight activity in Englewood.

Question Presented and Summary of Key Findings

Question presented: How will projected changes in truck traffic resulting from the proposed merger impact road safety and community mobility concerns in the Englewood community of Chicago?

- **Englewood currently bears a higher injury burden from truck and freight-related crashes.** HDV crashes cause an average of 5.6 injuries per square mile per year in Englewood vs. 3.4 citywide (1.7 times as many). Freight-related crashes lead to 0.96 injuries per square mile per year in Englewood, vs. 0.39 citywide and 0.17 in parts of the City of Chicago outside a 5-mile radius from the center of Englewood.

* My name is Nathan (Nate) Blum. I am a 2nd year PhD candidate in the Mobility and Behavior Lab, advised by Professor Amanda Stathopoulos of the Northwestern University McCormick School of Engineering's Department of Civil and Environmental Engineering. The Lab has significant experience with such safety and resilience analyses, including work pertaining to freight trucking in particular, with publications in Transportation Research Part A and other influential transportation journals. Prior to joining the Lab, I earned my B.S. in Computer Science from Rutgers University – New Brunswick, and spent two years engaged in railway traffic management optimization research.

- **Freight-related crash hotspots exist at multiple locations across Englewood, including several rail-adjacent areas.** Clusters appear at the northeast corner of Englewood along Garfield Boulevard (the current southern extent of the 47th Street Yard), along 59th Street, where the 47th Street Yard's accessory truck expansion is being completed (Figure 1), and around 63rd Street in the neighborhood's interior, which connects to the 63rd Street Yard on the other side of the Dan Ryan Expressway. Additional hotspots exist at several locations where rail embankments cross streets on viaducts with low clearances, and along Western Avenue and 75th Street near the Landers Yard.
- **Truck crashes in Englewood injure about twice as many people per crash as truck crashes elsewhere in Chicago** (25.3 vs. 12.3 injuries per 100 crashes; ratio 2.07, 95% CI 1.68–2.48). The gap persists after controlling for crash characteristics and when only crashes with police on scene are compared.
- **The injury gap is not explained by the type, timing, or circumstances of crashes, prevalence of low-clearance strikes, or road condition**. Similarly high injury rates in nearby South and West Side police districts and community areas point to area-wide factors such as neighborhood characteristics, street design, and traffic exposure that crash data can only partly measure.

The Lab's central finding as to the specific question presented is: **Under the Applicants' projections, the merger would add an estimated 6.0 freight-related truck crashes** (range 2.7–11.5) **and 1.5 injuries** (0.7–3.3) **per year in Englewood, and 42 crashes** (19–57) **and 6.3 injuries** (2.8–9.1) **per year citywide, nearly all within 5 miles of Englewood**. This is calculated assuming a proportional-growth scenario in crashes, scaling historical crashes by the Applicants' projections to yield scenario estimates associated with operations at this particular Yard, not validated forecasts.

Background

Englewood sits at the junction of several of Chicago's busiest freight facilities and corridors. Norfolk Southern's (NS) 47th Street intermodal terminal (47th Street Yard) borders the neighborhood's northeast corner, NS's Landers Yard lies at its southwest corner, the Dan Ryan Expressway runs along its eastern edge, and there is an additional NS yard on 63rd Street on the other side of the Expressway.[1] The NS 47th Street Yard was not identified in the Applicants' Operating Plan as having a pre-merger plan for expansion or as needing capital investment as a result of the merger[a]. However, NS currently has an ongoing capital project to expand the accessory yard (Figure 1), so understanding the post-merger impact on local traffic must take the area of that ongoing expansion into account.

In our analysis, 67% of the Englewood community area lies within one mile of a major Union Pacific (UP) or NS yard. The median distance from a crash in Englewood to the nearest UP or NS yard is 1 mile, compared with 2.6 miles elsewhere in Chicago; this reflects both the fact that much of Englewood is proximate to major freight yards, and that such yards are hotspots for some types of crashes. Intermodal yards are sources of heavy-duty "drayage" truck trips that carry containers between the railyard and customers, placing diesel truck traffic on streets in and around residential neighborhoods.[2]

Traffic safety is a long-standing concern in Englewood. The City of Chicago's "Vision Zero Chicago Action Plan" identified Englewood as one of eight "High Crash Areas" with significantly higher rates of fatal and serious-injury crashes than the City average and reported that traffic fatality rates in areas of high economic hardship are three times those in low-hardship areas (4.8 vs. 1.6 deaths per 100,000 residents).[3] Research in other cities has found that excess road traffic injuries in low-income urban areas are explained in large part by greater exposure to traffic and by arterial road design.[4,5]

[a] Rev. Appl. 2-752-754, V.S. Gehringer and Orr 601.

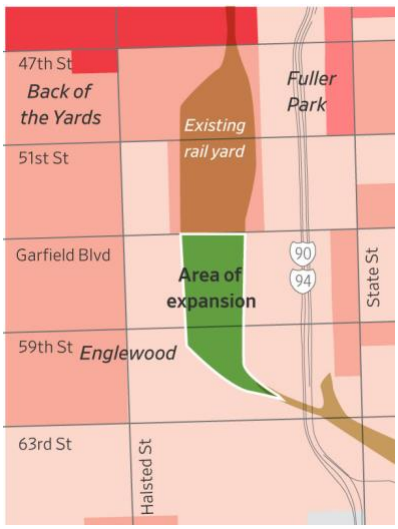

Figure 1. Planned expansion of the 47th Street Yard in Englewood.
Sources: Wall Street Journal[29]

The proposed Union Pacific–Norfolk Southern (UPNS or Applicants) merger would change truck traffic at these facilities in and around Englewood. In the master data tables submitted in response to the Surface Transportation Board (STB) Office of Environmental Analysis (OEA) Information Request No. 4, the Applicants project that over-the-road truck traffic at the 47th Street Yard would grow from 676 trucks per day at baseline to 757 per day in Year 5 without the transaction and to 958 per day in Year 5 with it. This is an increase of 201 trucks per day (27%) attributable solely to the merger.[6] Applicants have quantified truck traffic changes at each facility but do not estimate the changes in traffic crashes or injuries that would accompany them. This memorandum addresses that question.

Methodology

Crash Data

Crash records come from three linked City of Chicago datasets: crash-level records with date, location, crash type, damage bracket, injuries by severity, report type and police beat;[7] vehicle-level records with vehicle type, maneuver and carrier;[8] and person-level records with person type and injury classification.[9] We used all crashes from January 1, 2021 through early November 2026 (5.84 years). After excluding approximately 1% of crashes that lacked a usable location, the analysis includes 636,178 crashes inside the City limits. Injuries are assessed by the responding officer on the Illinois Traffic Crash Report (Illinois SR1050) using the standardized KABCO injury classification scale (fatal, incapacitating, non-incapacitating, and "reported, not evident").[9] Not all crashes are investigated by an officer at the scene. According to the City of Chicago, approximately half of crash reports are submitted by drivers at police stations (desk reports), while the remainder are documented by responding officers at the scene.[7] Consequently, recorded injury classifications do not always reflect direct observations by an officer and may be influenced by reporting practices or individual factors. Variations in rates of police presence on-scene at crashes may contribute slightly to variations in reported injury rates.

The dataset documents "each traffic crash on city streets within the City of Chicago limits and under the jurisdiction of Chicago Police Department"[7]; crashes handled by other agencies, typically those on interstate highways and freeway ramps, which fall under the Illinois State Police, are excluded. Crashes on the Dan Ryan Expressway (I-90/94), which carries 16,000–26,000 heavy commercial vehicles per day, along Englewood's eastern edge, are therefore not in these data. All truck entrances to the 47th Street Yard are within a mile of a Dan Ryan Expressway on- or off-ramp. We discuss the implications of this exclusion in Results.

Study Areas

Englewood is represented in the figures below by a polygon covering both the Englewood and West Englewood community areas (6.23 square miles).[10] We compare it with the area of Chicago within 5 miles of Englewood's center, the rest of Chicago beyond 5 miles, and Chicago citywide. The city boundary and Census block groups come from Census Bureau boundary files.[11] When comparing data between Chicago's 77 community areas, Englewood and West Englewood are ranked separately because the data uses the official community boundaries. Maps show a 4-mile window around Englewood.

Definitions

An HDV crash is any crash involving at least one vehicle recorded as a single-unit truck, a single-unit truck with a trailer, or a truck-tractor with or without a semi-trailer; pickups are a separate vehicle type and are excluded. Citywide, the HDVs involved were 22,872 single-unit trucks, 11,122 tractors with semi-trailers, 2,840 single-unit trucks with trailers and 1,428 tractors without semi-trailers.

A freight-related crash meets at least one of three criteria, assigned in order so that no crash is counted twice: (1) a vehicle whose carrier is recorded as UP or NS (provided by City of Chicago data); (2) a collision with a train or at a rail crossing within 250 feet of UP or NS track; or (3) a crash involving a tractor-trailer or intermodal container chassis within 1 mile of a major UP or NS yard. UP and NS track (owned or operated under trackage rights) and yard footprints come from the national rail network database[1]; a major yard has at least 5 miles of yard track, and eight qualify in and around Chicago. The third criterion accounts for 3,508 of 3,723 freight-related crashes citywide and 141 of 147 in Englewood, serving as a proxy to identify crashes near intermodal yards involving the types of trucks that serve them, rather than trucks confirmed to be on railroad business.

Crash and injury rates are expressed per square mile per year, because truck volume data are not available for most roads in Englewood; injury outcomes are expressed as injuries per 100 crashes. Property damage is reported only in brackets (up to $500, $501–$1,500, over $1,500), so dollar totals are lower bounds.

Hot Spot Mapping

Crash locations were aggregated to hexagonal grid cells of approximately 600 feet across for the study-area map and approximately 400 feet across for Englewood close-ups, shaded on a logarithmic scale. Freight-related crashes are mapped individually and sized by damage bracket.

Statistical Analysis

Injury counts per crash are overdispersed (most crashes have none and a few have many), so we modeled them with negative binomial regression, the standard approach for crash count data.[12] Results are reported as incidence-rate ratios (IRRs): the ratio of expected injuries per crash in Englewood to that elsewhere in Chicago. Standard errors are clustered by Census Block Group because crashes on the same streets are not independent.[13] Models were estimated with statsmodels[14] and compared with Poisson versions. We first compared Englewood with the rest of Chicago, then accounted for crash type, speed limit, number of vehicles, darkness, hit-and-run status, and year. We also examined crashes where police were present, accounted for differences across police districts, and, for tractor-trailer crashes, considered the truck's movements and driving conditions. A separate model using all crashes tested whether the higher injury rate was common to Englewood or especially pronounced in truck crashes. We also calculated a bootstrap 95% confidence interval for the main injury ratio.[15] To check the accuracy of our results, we independently recalculated all crash and injury counts from the original data and obtained identical results. Injury totals were also compared with the person-level records, with a difference of less than 0.3%.

Low Clearances

Posted vertical clearances come from the City's list of height and weight limits for trucks and large vehicles, which includes 1,678 posted clearances at viaducts, overpasses, rail bridges and overhead structures.[16] A clearance is classified as low if it is under 13 feet 6 inches, the maximum legal vehicle height in Illinois.[17] An HDV crash recorded as a collision with a fixed object within 150 feet of a low clearance is classified as a likely clearance strike, a recognized and recurring hazard at low bridges.[18,19]

Supplementary Data

Traffic volumes on the Dan Ryan Expressway and on Englewood's arterials come from Illinois Department of Transportation (IDOT) traffic counts.[20] Pavement roughness on larger roads comes from the International Roughness Index (IRI) values in IDOT's 2024 Highway Performance Monitoring System submission,[21] classified with the federal thresholds (good below 95 inches per mile, poor above 170).[22] Pothole complaints come from the City's 311 service requests.[23]

Merger Scenarios

Facility-level projections come from the Applicants' master data tables[6]. To translate truck projections into crash estimates, yard-related truck crashes tied to the 47th Street Yard (criterion 3 crashes whose nearest major yard is that Yard) were scaled by the ratio of projected to baseline trucks per day. Three variants bracket the uncertainty: a low variant in which crashes grow half as fast as truck traffic (elasticity 0.5) within 1 mile of the Yard; a central variant in which crashes grow in proportion to truck traffic within 1 mile; and a high variant that also counts tractor-trailer and container crashes up to 2 miles from the Yard. Injuries per crash are held at observed rates, and all other crashes are held at current levels. The merger effect is the difference between Year 5 with and without the transaction. Chicago facilities not listed in the tables (because their projected changes fall below the Board's thresholds) are held constant.

Results

Crash and Injury Burden in Englewood

Englewood's overall crash density matches the density in the 5-mile area surrounding it (487 crashes per square mile per year) and is marginally higher than the citywide rate. Crashes in Englewood, however, consistently produce more injuries: 153.9 injuries per square mile per year, compared with 120.4 in the 5-mile area surrounding Englewood, and 94.5 in the rest of Chicago (Table 1). The same pattern holds for truck crashes. Englewood has the lowest HDV crash density as compared to the surrounding area or rest of the city, which may partly reflect the exclusion of crashes on the adjacent Dan Ryan Expressway (see below). However, HDV crashes in Englewood have a far higher injury density when compared to elsewhere in the city (5.64 per square mile per year, versus 4.26 for the surrounding area and 2.92 in the rest of the city). Freight-related crashes occur at 3.6 times the rate as in the rest of Chicago beyond 5 miles, though at a lower rate than

Table 1. Crashes and injuries per square mile per year (total in parentheses), January 2021 – November 2026

Area	All crashes	HDV crashes	Freight-related crashes	All injuries	Injuries in HDV crashes	Injuries in freight-related crashes
Englewood	487.3 (17,711)	22.3 (810)	4.04 (147)	153.9 (5,594)	5.64 (205)	0.96 (35)
Within 5 mi of Englewood (excl. Englewood)	487.2 (183,811)	27.5 (10,378)	6.66 (2,512)	120.4 (45,428)	4.26 (1,607)	0.91 (343)
Rest of Chicago (beyond 5 mi)	463.3 (434,656)	26.7 (25,086)	1.13 (1,064)	94.5 (88,649)	2.92 (2,739)	0.17 (155)
All of Chicago	470.6 (636,178)	26.8 (36,274)	2.75 (3,723)	103.3 (139,671)	3.37 (4,551)	0.39 (533)

Notes: Values are annual rates per square mile; total counts over the study period are shown in parentheses. The three geographic subareas do not overlap; the citywide row includes all three. Englewood combines the Englewood and West Englewood community areas.

Sources: City of Chicago, *Traffic Crashes–Crashes* and *Traffic Crashes–Vehicles*; National Transportation Atlas Database (UP/NS track and yard locations).

the rest of the 5-mile area, which contains other neighborhoods adjacent to these and other major railyards. Over the study period, Englewood's 810 HDV crashes injured 205 people and killed 3, with at least $930,724 in property damage; its 147 freight-related crashes injured 35 people.

Where Freight-Related Crashes Occur

Across the 4-mile area around Englewood, truck crashes concentrate in the industrial corridors to the north and northwest and around the yards (Figure 2, left). Within Englewood, HDV crashes concentrate on Western Avenue just west of the neighborhood, Garfield Boulevard, and 59th, 63rd and 71st Streets, while residential interior streets see relatively few (Figure 2, right). All except 71st Street are close to existing yards or ongoing expansions of existing yards, including the 47th Street Yard, the 63rd Street Yard, and Landers Yard.

Freight-related crashes in Englewood are not confined to the yard entrances (Figure 3). Distinct clusters appear at (1) the northeast corner along Garfield Boulevard, beside the 47th Street Yard and the Dan Ryan; (2) along 59th Street, including at Halsted Street, and (3) along 63rd Street, both near the southern expansion of the 47th Street Yard, with 63rd Street also leading east to the 63rd Street Yard; (4) near Marquette Road (67th Street) at the north–south rail embankment through the eastern half of the neighborhood; and (5) at the southwest corner along Western Avenue and 75th Street near the NS Landers Yard.

Injurious tractor-trailer crashes are also spread across interior streets. Among tractor-trailer crashes inside Englewood with police on scene, the most injuries occurred on 59th Street (16 injuries in 39 crashes) and Ashland Avenue (13 in 18), followed by 71st Street (6 in 41), Marquette Road (5 in 15) and 63rd Street (4 in 11). Garfield Boulevard, Western Avenue, 59th Street, and 63rd Street, all of which intersect either with an existing yard or near the ongoing expansions of the 47th Street Yard, together account for 30% of these injuries; the remainder are spread across other streets in the neighborhood.

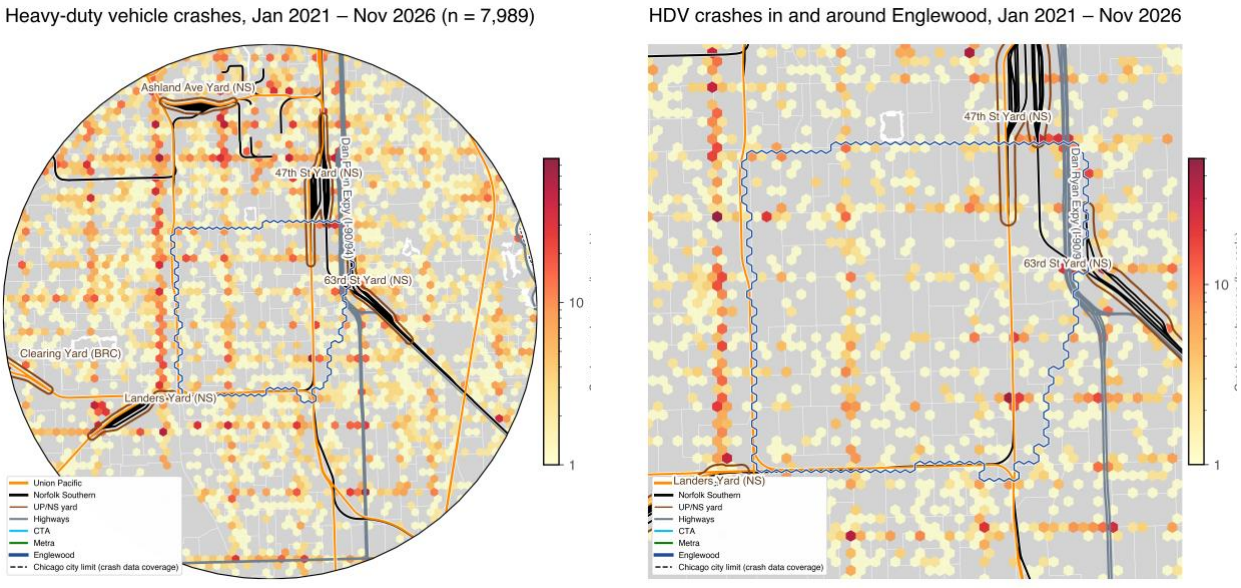

Figure 2. Density of heavy-duty vehicle (HDV) crashes, January 2021 – November 2026. Left: 4-mile window around Englewood (blue outline), hexagons about 600 feet across. Right: Englewood close-up, hexagons about 400 feet across. Color shows crashes per hexagon on a log scale. Orange and black lines are UP and NS track; brown outlines are major UP/NS yards.
Sources: City of Chicago Traffic Crashes[7,8]; National Transportation Atlas Database[1].

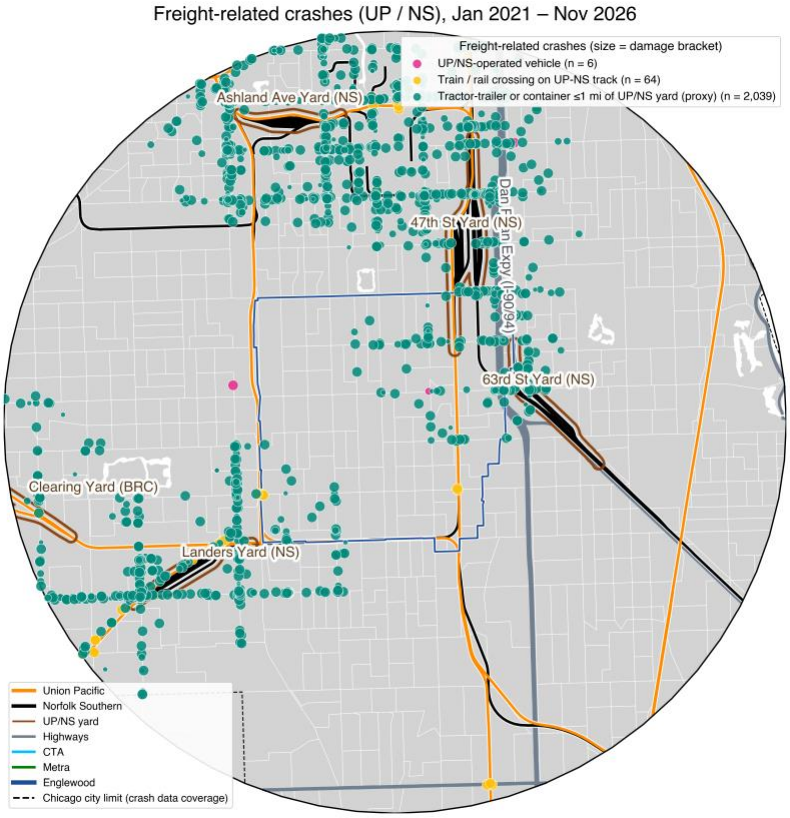

Figure 3. Freight-related crashes in and around Englewood, January 2021 – November 2026, by criterion: UP/NS-operated vehicle (pink), train or rail-crossing crash on UP/NS track (gold), and tractor-trailer or container crash within 1 mile of a major UP/NS yard (teal). Marker size shows the damage bracket. Counts in the legend include the area mapped around Englewood.

Table 2, which displays totals and shares of crashes and injuries in Englewood by their distance from a yard, further demonstrates the disproportionate concentration of injuries from HDV and freight-related crashes in proximity to yard areas. We observe slight overconcentration of HDV crashes (assuming they should be evenly distributed over the area of Englewood) proximate to yards, as the share of crashes within each boundary is higher than its share of land area.

Table 2. HDV and freight-related crashes and injuries by distance from a yard, January 2021 – November 2026

Area	Distance from a yard	Land area (sq. mi)	All crashes	HDV crashes	Freight-related crashes	All injuries	Injuries in HDV crashes	Injuries in freight-related crashes
Englewood	≤ 500 ft	0.32 (5.18%)	719 (4.06%)	50 (6.17%)	24 (16.2%)	239 (4.27%)	19 (9.27%)	7 (20.0%)
	≤ 1000 ft	0.61 (9.85%)	1,546 (8.73%)	106 (13.09%)	48 (32.4%)	501 (8.96%)	45 (22.0%)	20 (57.1%)
	≤ 0.5 miles	1.53 (24.5%)	4,193 (23.7%)	229 (28.3%)	99 (66.9%)	1,331 (23.8%)	72 (35.1%)	27 (77.1%)
	Whole area	6.23	17,711	810	148	5,594	205	35
City of Chicago	≤ 500 ft	5.68 (2.45%)	9,668 (1.52%)	1,082 (2.98%)	664 (16.5%)	2,643 (1.89%)	219 (4.81%)	115 (19.3%)
	≤ 1000 ft	9.19 (3.97%)	18,436 (2.90%)	1,824 (5.03%)	1,039 (25.8%)	4,935 (3.53%)	370 (8.13%)	183 (30.8%)
	≤ 0.5 miles	23.65 (10.2%)	50,047 (7.87%)	4,077 (11.2%)	2,128 (52.8%)	13,266 (9.5%)	734 (16.1%)	330 (55.5%)
	Whole area	231.6	636,178	36,274	4,033	139,671	4,551	595

Notes: Values are totals over the time period within the given geographic area; their percent share of the total for the given area are in parentheses.

Sources: City of Chicago, *Traffic Crashes–Crashes* and *Traffic Crashes–Vehicles*; National Transportation Atlas Database (UP/NS track and yard locations).

However, the share of HDV injuries within these same boundaries is far higher even than the share of HDV crashes, with the same applying to a greater degree to freight-related crashes. The data implies that not only are HDV and freight-related crashes more likely to occur in close proximity to yards (likely due to higher

volumes of such traffic), but that such yard-adjacent crashes cause a disproportionate number of injuries when compared to crashes in the rest of the neighborhood. This is especially visible with the 1000-foot boundary: HDV crashes in this boundary make up ~13% of HDV crashes in the Englewood area, but 22% of the injuries (32.4% and 57.1% for freight-related crashes). Put another way, HDVs average 0.253 injuries per crash throughout Englewood, but 0.425 injuries per crash within 1000 feet of a yard (0.236 and 0.417 for freight-related crashes), meaning an HDV crash within 1000 feet of a yard is 1.68 times more likely to cause an injury (1.77 times). Crucially, this gap is higher in Englewood than in the rest of Chicago, especially for freight-related crashes. While this phenomenon does apply throughout the City, the same calculation finds that an HDV crash within 1000 feet of a yard city-wide is 1.62 times more likely to cause an injury (0.203 injuries/crash inside vs. 0.125 injuries/crash outside), with the equivalent rate for freight-related crashes being 1.2 times (0.176 injuries/crash inside vs. 0.147 injuries/crash outside).

Low clearances form another set of hot spots in the interior. Englewood has 8.5 posted clearances under 13 feet 6 inches per square mile, compared with 2.4 in the rest of Chicago, with the lowest in Englewood at about 11 feet 2 inches (Winchester Avenue) and 11 feet 4 inches (Union Avenue, 60th Street, 60th Place and Green Street). Most line the rail embankments along 59th Street and through the eastern half of the neighborhood (Figure 4). Of Englewood's HDV crashes, 11.5% were likely clearance strikes, compared with 1.8% elsewhere; these strikes account for most of the difference between Englewood's share of fixed-object truck crashes (21.7%) and the citywide share (8.9%). Studies of bridge strikes elsewhere find that they recur at a small number of low structures and pose safety and congestion hazards beyond the damage to the structure itself.[18,19] One bridge in particular, spanning 71st Street between Wallace Street and Parnell Avenue, had 54 truck crashes into a fixed object occur within 150 feet of it within the study period, which is the most of any posted low-clearance in Chicago (the next highest has 38). Strikes at this single bridge led to 7 injuries, which comprised 87.5% of low-clearance strike injuries in the Englewood area, and 30.4% of such injuries

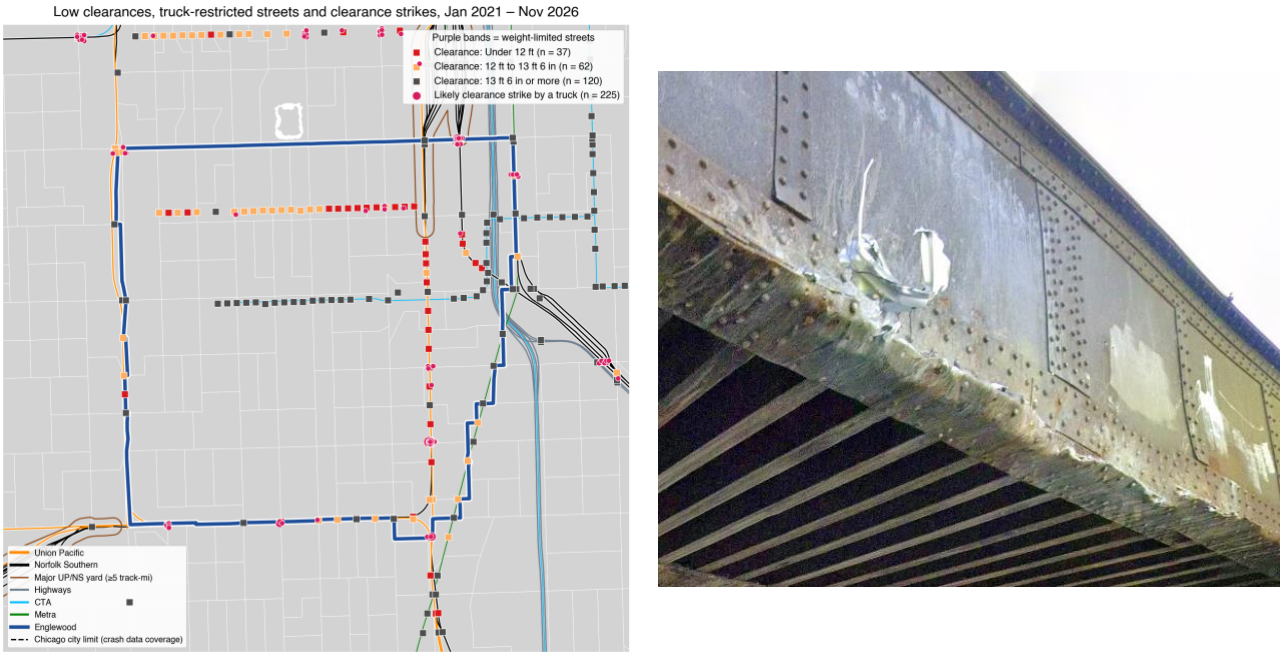

Figure 4. Left: Posted vertical clearances and likely clearance strikes by trucks in and around Englewood. Squares show posted clearances by height; pink circles show HDV fixed-object crashes within 150 feet of a clearance under 13 feet 6 inches, sized by number of injuries. Right: Street view of the 71st Street rail viaduct at Wallace Street, showing clear damage to the bridge's lower edge as well as likely leftover debris from prior low-clearance strikes.
Sources: City of Chicago Height and Weight Limits for Trucks and Large Vehicles[16]; Traffic Crashes[7,8], Street View image © Google[24].

citywide. This bridge is near the southern edge of the 63rd Street Yard, as well as sitting along a likely route for trucks leaving the Dan Ryan Expressway to travel west, including to the NS Landers Yard not far away.

HDV Crash Counts and the Dan Ryan Expressway

Measured with the City's data, Englewood's HDV crash density (22.3 per square mile per year) is below the citywide average (26.8), and a smaller share of its crashes involve an HDV (4.6% vs. 5.7%; odds ratio 0.79, 95% CI 0.64–0.96), but it is not the case that Englewood faces less risk from truck traffic.

Without HDV volumes for Englewood streets, we cannot say with certainty whether trucks in Englewood crash less often or whether there are fewer of them, but an important factor is that crashes on the Dan Ryan Expressway, a heavy truck corridor which passes through Englewood, are counted by Illinois State Police and therefore not reflected in the City of Chicago data. Trucks originating from or destined to local yards have rapid access to the Expressway and are likely to use it for as much of their journey as possible, and therefore may spend less of their time in Englewood on streets for which we have data. This may help explain why Englewood's HDV crash numbers appear similar to or lower than the rest of Chicago. However, such crashes still affect Englewood. IDOT's 2025 counts on the Dan Ryan segments next to Englewood report 300,900–343,600 vehicles per day, including 16,000–26,000 heavy commercial vehicles per day,[20] and its interchanges and on-ramps connect directly to neighborhood arterials, making them likely routes for trucks to take toward their final destinations. Thus, crashes on the Expressway are likely to cause excess traffic to spill onto the streets of Englewood, increasing neighborhood congestion.

Injuries in Truck Crashes

Truck crashes in Englewood lead to an average of 25.3 injuries per 100 crashes, compared with 12.3 elsewhere in Chicago, a ratio of 2.07 (bootstrap 95% CI 1.68–2.48) (Table 3). The proportion of truck crashes that caused at least one injury is also higher (16.2% vs. 9.0%, a ratio of 1.8). Crashes with at least one injury caused 1.56 injuries on average, vs. 1.39 city-wide (ratio of 1.12). These ratios reveal that the higher likelihood of crashes to cause injuries accounts for roughly 80% of the gap in injury rate, while the rest is explained by the slightly higher number of injuries per injurious crash. Furthermore, crashes in Englewood involve the same number of people on average as those citywide (1.98 vs. 1.96), but twice the share of them are injured (12.8% vs. 6.3%). Since a single high-injury crash, such as one involving a bus, can bias an average, we test the effect of capping the number of injuries per crash in the data by only considering the first two. This results in 21.7 injuries per 100 crashes in Englewood versus 11.2 injuries per 100 crashes elsewhere, which is not significantly lower and demonstrates that the gap is likely the result of underlying local factors as opposed to data abnormalities. Fatal and incapacitating injuries see a similar near-doubling in frequency as lower-severity injuries do (2.1 vs. 1.1 per 100 crashes). Table 3 shows that the gap in injury rate extends to each level of

Table 3. Injury outcomes in truck crashes: Englewood vs. the rest of Chicago, January 2021 – November 2026

Measure	Englewood	Rest of Chicago
Truck crashes	810	35,464
Injuries per 100 truck crashes	25.3	12.3
Truck crashes with any injury	16.2%	9.0%
Injuries per 100 crashes, capped at 2 injuries per crash	21.7	11.2
Fatal and incapacitating injuries per 100 crashes	2.1	1.1
Non-incapacitating injuries per 100 crashes	12.2	6.3
“Reported, not evident” injuries per 100 crashes	11.0	4.8
People involved per crash	1.98	1.96
Share of people involved who were injured	12.8%	6.3%

Notes: Injury severity is classified using the KABCO scale recorded in police crash reports. Not all crashes are investigated by an officer at the scene.

Sources: City of Chicago, *Traffic Crashes–Crashes*, *Traffic Crashes–Vehicles*, and *Traffic Crashes–People*.

severity and provides additional context.

Hypotheses for Higher Injury Rates in Englewood

Table 4 shows model results for each tested hypothesis. Each model reports an incidence-rate ratio (IRR): the expected number of injuries per crash in one group divided by the expected number in another. An IRR of 2.00 means twice as many injuries per crash, and 1.00 means no difference. Without any adjustments, a

Table 4. Injury-rate ratios (IRRs) from every model tested: truck crashes and injuries, Englewood vs. the rest of Chicago (RC)

Model	Sample	Comparison	Negative binomial IRR (95% CI)	p-value
A. Testing gap specificity to HDV crashes vs. all crashes (base sample is all crashes citywide, n = 636,178)				
No controls	All reports	Englewood vs. rest of Chicago, non-truck crashes	1.43 (1.37–1.50)	*<0.001*
+ is HDV		Englewood vs. RC, excess from truck crashes	1.44 (1.16–1.79)	*0.001*
No controls	Police on scene only	Englewood vs. RC, non-truck crashes	1.21 (1.16–1.26)	*<0.001*
+ is HDV		Englewood vs. RC, excess from truck crashes	1.59 (1.24–2.04)	*<0.001*
B. Crash characteristics (base sample is truck crashes citywide, n = 36,274)				
No controls	All reports	Englewood vs. RC	2.07 (1.65–2.58)	*<0.001*
+ crash type		—	2.07 (1.59–2.70)	*<0.001*
+ posted speed limit, number of vehicles		—	1.96 (1.52–2.51)	*<0.001*
+ darkness, hit-and-run		—	1.98 (1.54–2.55)	*<0.001*
+ year (all crash controls)		—	1.98 (1.54–2.55)	*<0.001*
No controls	Police on scene only	—	1.92 (1.48–2.49)	*<0.001*
C. Tractor-trailer characteristics (tractor-trailer crashes citywide with police on scene, n = 8,488)				
No controls	Police on scene only	Englewood vs. RC	2.38 (1.58–3.59)	*<0.001*
+ truck maneuver setting		—	2.30 (1.53–3.47)	*<0.001*
+ involved a moving car		—	2.60 (1.87–3.61)	*<0.001*
+ off-street, near a yard		—	2.53 (1.78–3.60)	*<0.001*
+ posted speed limit (all controls)		—	2.53 (1.78–3.61)	*<0.001*
D. Proximity to rail yards (truck crashes)				
Proximity to yard	All reports	Englewood vs. RC, same distance from a yard	1.81 (1.46–2.24)	*<0.001*
+ within 1 mile of a UP/NS yard		Within 1 mi of UP/NS yard vs. not near any yard	1.39 (1.21–1.60)	*<0.001*
+ within 1 mile of another railroad's yard		Within 1 mi of other railroad's yard vs. not near any yard	1.23 (1.07–1.42)	*0.004*
Proximity to yard	Police on scene only	Englewood vs. RC, same distance from a yard	1.75 (1.36–2.25)	*<0.001*
+ within 1 mile of a UP/NS yard		Within 1 mi of UP/NS yard vs. not near any yard	1.26 (1.07–1.49)	*0.005*
+ within 1 mile of another railroad's yard		Within 1 mi of other railroad's yard vs. not near any yard	1.16 (1.00–1.35)	*0.046*

Notes: IRR = incidence-rate ratio: expected injuries per crash in the first group named in the Comparison column divided by expected injuries in the second; RC = rest of Chicago; a dash repeats the comparison above. Rows beginning with "+" add variables to the model in the row above, except in Panels A and D, where rows within each sample are terms from a single model. All models are negative binomial regressions with standard errors clustered by Census block group; Panel D models also control for year. "Police on scene only" excludes crashes reported later at a police station.

Sources: City of Chicago, Traffic Crashes – Crashes, – Vehicles and – People; National Transportation Atlas Database.

truck crash in Englewood is expected to involve 2.07 times as many injuries as a truck crash elsewhere in Chicago. The analyses below rule out most explanations rooted in the crashes themselves and point instead to factors shared across Englewood and neighboring South and West Side communities, which the crash data can only partly measure.

Analyses here concern how many people are injured per crash, not how often crashes occur, as these are separate questions; the second is challenging to answer without HDV traffic volume data. However, we find that a crash within 1 mile of a major UP or NS yard has 1.44 times the odds of involving an HDV (95% CI 1.26–1.64) and such truck crashes in Englewood injure about twice as many people as elsewhere. Together, these findings imply that additional freight activity near Englewood would produce more injuries there than the same activity would elsewhere in the city.

Excess injuries in Englewood are partly attributable to neighborhood-wide factors and partly to truck involvement (Table 4, Panel A). Non-truck crashes in Englewood are 1.43 times as injurious as non-truck crashes elsewhere, and truck crashes carry an additional factor of 1.44 on top of that. Additionally, part of the neighborhood-wide excess appears to reflect how crashes are recorded. Officers assign injury severity at the scene, and studies linking police reports to medical records find these ratings are often inaccurate, especially for less severe injuries.[25,26] Accuracy also varies considerably among law enforcement agencies[27], and minor crashes are systematically underreported in police data.[28] In Englewood, police were on scene for a larger share of crashes (69% of truck crashes vs. 61% elsewhere), and officers recorded more possible injuries ("reported, not evident"; 11.0 vs. 4.8 per 100 truck crashes). When only crashes with police on scene are compared, the neighborhood-wide factor falls from 1.43 to 1.21. The truck-specific factor, however, rises from 1.44 to 1.59, and fatal and incapacitating injuries are also about twice as common in Englewood truck crashes. Reporting differences therefore explain part of Englewood's general injury excess, but not the additional excess in its truck crashes.

Accounting for crash type, posted speed limit, number of vehicles, darkness, hit-and-run and year lowers the IRR only from 2.07 to 1.98 (Panel B). In other words, a truck crash in Englewood is expected to involve about twice as many injuries as a similar truck crash elsewhere. The gap appears within nearly every crash type, and increases for tractor-trailer crashes (Panel C): 2.38, rising to 2.53 after accounting for the truck's maneuver, whether a moving car was involved, whether the crash was off-street or near a yard, and the speed limit. Englewood's tractor-trailer crashes are only slightly more often in moving traffic (86% vs. 79%) and less often involve a moving car (51% vs. 60%). Although low-clearance strikes are common in Englewood, they rarely injure anyone (8.6 injuries per 100 strikes) and account for only 3.9% of truck-crash injuries. Excluding them widens the gap (27.5 vs. 12.4 injuries per 100 truck crashes).

Road condition does not explain the gap either. Roads in Englewood with roughness ratings are generally in poorer condition than those elsewhere in Chicago (an average International Roughness Index of 301 inches per mile, with 97% of rated miles in poor condition vs. 76% elsewhere, based on about 9 rated miles in Englewood), but rougher pavement is not associated with more injuries per truck crash (IRR 0.99 per 50-point increase, 95% CI 0.96–1.02). Pothole complaints near Englewood's truck crashes are no more common than near truck crashes elsewhere (a median of 1.9 complaints per year within 250 feet in both),[23] and the modest citywide association between pothole complaints and injuries disappears once the number of other crashes nearby is taken into account. Police-recorded road defects are not associated with more injuries either (IRR 0.96, 95% CI 0.70–1.30). Accounting for each of these measures leaves Englewood's IRR essentially unchanged.

Truck crashes near yards are more injurious everywhere in the city: 1.39 times as injurious within 1 mile of a UP or NS yard, and 1.23 times near other railroads' yards, compared with crashes not near any major yard (Panel D). Englewood's truck crashes are more often near yards, so accounting for proximity lowers Englewood's IRR from 2.07 to 1.81, but most of the gap remains. Of community areas in Chicago that are near major freight yards (defined as having ≥25% of their land be within 1 mile of a major freight yard), West Englewood and Englewood rank very highly in injury rates from truck crashes (Figure 5). The highest on-

scene truck-crash injury rates are in West Englewood (35.2 per 100), East Garfield Park (33.0), West Pullman (32.4), Grand Boulevard (31.4) and Englewood (28.7). This gap persists even when controlling for differences in the frequency of police presence on scene (relevant as police may anticipate the higher injury likelihood and be more likely to respond on scene) and other factors. We observe that 7 of the top 8 community areas for injuries per 100 truck crashes are categorized as being primarily near UP/NS yards, and a further 11 of the top 14 are as well. We do not find a clear reason behind this disparity between operators and believe further investigation must be done.

The lowest rates of injuries from truck crashes are in industrial, truck-heavy communities that are as close to yards as Englewood or closer. New City (12.8) and Brighton Park (12.4) lie almost entirely within a mile of a major yard, as do most of Archer Heights (12.8) and the Lower West Side (12.9); each has 500 to 1,200 truck crashes. Meanwhile, West Pullman and East Garfield Park have well under half their land near a yard. Injuries per truck crash track the neighborhood more closely than truck activity or yard proximity, implying a large contributing factor to higher injury rates may be the heavily residential nature of Englewood, and thus that local inhabitants must share roads designed primarily for their traffic with HDVs that may find it difficult to navigate narrow streets.

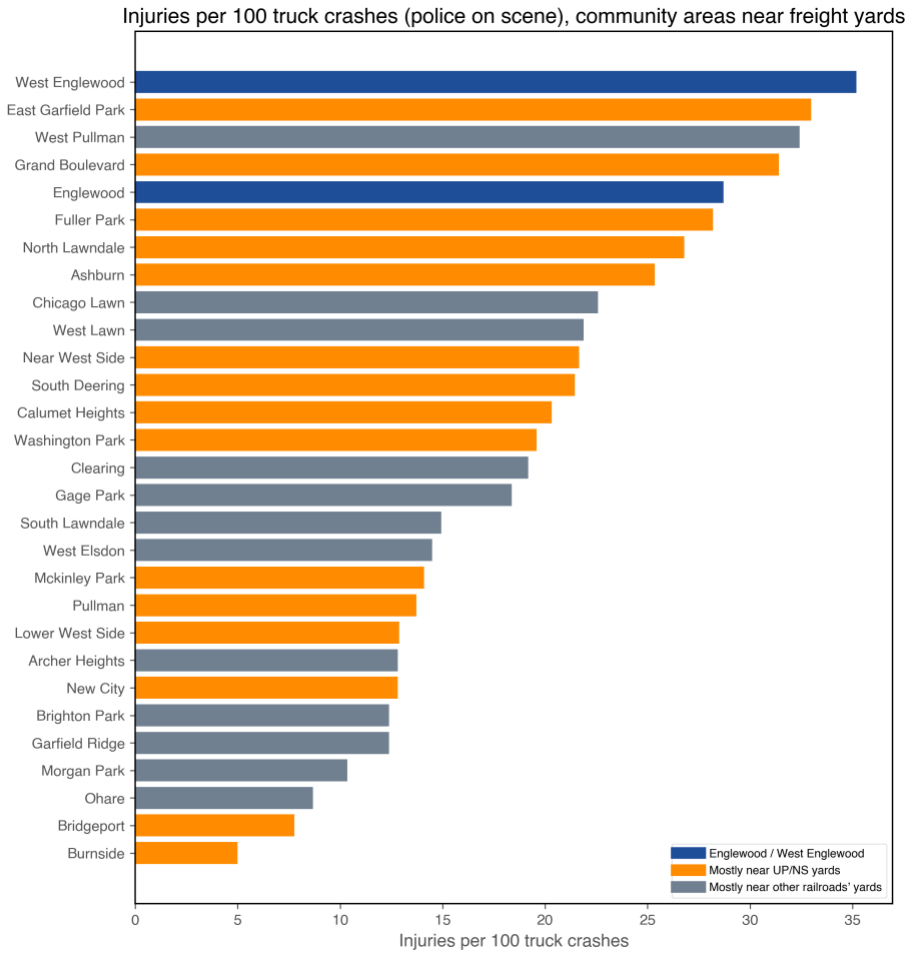

Figure 5. Injuries per 100 truck crashes in community areas near major freight yards operated by any company. Blue bars are Englewood and West Englewood, which are both near UP/NS yards, orange bars are other community areas near UP/NS yards, and grey bars are community areas near yards of other railroads. Only crashes in which police arrived on scene are included to control for differences in police arrival/reporting rates. Sources: National Transportation Atlas Database[1]; Traffic Crashes[7,8].

Several of the City of Chicago's Vision Zero High Crash Corridors[3] lie in or near Englewood (including Garfield Boulevard from Halsted Street to King Drive, Halsted Street from Marquette Road to 79th Street, Ashland Avenue from 59th to 69th Streets, and Western Avenue from 63rd to 74th Streets), and research elsewhere links excess traffic injuries in low-income neighborhoods to traffic exposure and road design[4,5]. Our data cannot measure these factors directly, but they are consistent with an area-wide pattern of this kind.

Projected Changes Under the Proposed Merger

The Applicants' master data tables list four Illinois intermodal or automotive facilities whose projected changes in traffic exceed the Board's thresholds (Table 5).[6] Of these, the 47th Street Yard is the one adjacent to Englewood. Applicants project its truck traffic will grow 27% as a result of the merger, on top of 12% organic growth from baseline.

Table 5. Projected over-the-road truck traffic at Illinois facilities listed in the Applicants' master data tables

Facility (owner)	Baseline trucks/day	Year 5, no merger	Year 5, with merger	Merger effect
Chicago 47th Street intermodal (NS)	676	757	958	+201 (+27%)
Global 2, Northlake (UP)	1,133	1,191	1,557	+366 (+31%)
Chicago Mixing Center, Hegewisch (NS)	64	72	115	+43 (+60%)
Centreville (UP)	7	7	35	+28 (+400%)

Notes: Merger effects are calculated relative to Year 5 without it. Global 2 is outside Chicago; Centreville is in the Metro East area. The Applicants did not provide truck traffic figures for the Ashland Avenue, 63rd Street or Landers Yard, all of which are near Englewood.

Source: Applicants' Master Data Tables, response to OEA Information Request No. 4, STB Docket No. FD 36873.

We scale yard-related crashes near the 47th Street Yard by these projections to produce a central estimate comparing Year 5 of the scenario with the merger to the Year 5 baseline. We find that freight-related crashes per year would increase by 6.0 (range 2.7–11.5) and injuries per year by 1.5 (0.7–3.3) in Englewood, while crashes per year would increase by 42.1 (18.7–56.6) and injuries per year by 6.3 (2.8–9.1) citywide (Table 6). Note that this specifically calculates increases in crashes and injuries in Englewood and citywide as a result of increased activity at the 47th Street Yard, and does not account for changes in activity at other UP/NS yards. As neither data on current traffic nor projections of future traffic for the Ashland, 63rd Street, and Landers Yards were provided by the Applicants, we cannot make any claims about their projected impact on HDV crashes.

Table 6. Projected yard-related truck crashes and injuries per year associated with the 47th Street Yard

Area	Today	Year 5, no merger	Year 5, with merger	Merger effect (range)
Crashes per year				
Englewood	20.2	22.6	28.6	+6.0 (2.7–11.5)
Within 5 mi of Englewood (excl. Englewood)	121.5	136.0	172.1	+36.1 (16.1–44.9)
All of Chicago	141.7	158.7	200.8	+42.1 (18.7–56.6)
Injuries per year				
Englewood	5.0	5.6	7.0	+1.5 (0.7–3.3)
Within 5 mi of Englewood (excl. Englewood)	16.1	18.0	22.8	+4.8 (2.1–5.8)
All of Chicago	21.1	23.6	29.9	+6.3 (2.8–9.1)

Notes: Yard-related crashes are tractor-trailer or container crashes whose nearest major yard is the 47th Street Yard. Values for today and Year 5 are based on the central scenario. Merger effects show the central estimate with low–high scenario ranges. Low scenario: crash elasticity of 0.5, within 1 mile of the yard. Central scenario: elasticity of 1, within 1 mile. High scenario: elasticity of 1, within 2 miles. Injuries per crash are held at observed rates. Changes beyond 5 miles are negligible (at most 0.2 crashes per year).

In Englewood, the merger would raise all freight-related crashes (including those near other yards) from 27.6 to 33.6 per year (+22% relative to Year 5 without the merger) and injuries in freight-related crashes from 6.6 to 8.1 per year (+22%). Because yard trucks are a small share of all truck traffic, total truck crashes in Englewood would rise about 4%. These figures are calculated assuming a proportional-growth scenario, and do not represent validated forecasts. All projections are summarized in Table 6.

These estimates likely understate the full effect on Englewood. They do not include additional clearance strikes from more trucks traveling among the neighborhood's low viaducts, crashes on the Dan Ryan Expressway, or any shift in which streets the additional trucks use, all of which would add to present congestion experienced by Englewood residents. They also do not account for changes in operations at other nearby yards, which may impact traffic patterns in unpredictable ways.

Limitations

- **Jurisdiction:** The City's data includes only crashes under Chicago Police Department jurisdiction. Crashes on the Dan Ryan Expressway and other interstates are excluded, which may understate truck crash exposure both near Englewood and further along the expressway as a result of trucks originating at the 47th Street yard.
- **Freight attribution:** Most freight-related crashes are inferred by a proxy (tractor-trailer or container crashes within 1 mile of a major UP/NS yard). Only 9 crashes citywide record UP or NS as the carrier, so the proxy cannot explicitly confirm that a truck was serving a railyard.
- **Injury and damage measures:** Injury severity is subject to the responding officer's assessment, which may vary in accuracy[25,26]. Property damage is recorded only in brackets.
- **Exposure:** No IDOT truck volume data is available for Englewood's local streets, so rates are expressed per square mile rather than per truck-mile.
- **Pavement data:** State roughness ratings cover only about 9 miles of road in Englewood, and 311 pothole complaints depend on residents' reporting, so road condition data is limited.

Recommended Further Analyses

- Obtain Illinois State Police or IDOT crash records for the Dan Ryan Expressway beside Englewood, and add this data to the analysis.
- Test hypotheses involving vehicle and occupant details using the person-level (safety equipment, hospital transport) and vehicle-level (model year) files, and link results to Census income and demographic data.
- Request heavy-vehicle classification counts on Englewood arterials, including Garfield Boulevard, 59th Street, 63rd Street, Ashland Avenue and Western Avenue, to support per-truck-mile rates.
- Model the street routes that additional 47th Street Yard trucks would use, including their exposure to low clearances, to study congestion effects.

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Attachment C

To: Robert Weinstock & Purba Mukerjee, Counsel for Sustainable Englewood Initiatives

From: Northwestern University Climate Change Research Group & Durango-Cohen Research Group

Date: November 18, 2026

Re: STB Docket No. 36873: Englewood/47th Street Yard Air Quality, Health Impacts, and Electrification Analyses

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Introduction

Sustainable Englewood Initiatives (SEI), a party to the proceeding reviewing the proposed acquisition of Norfolk Southern by Union Pacific (STB Finance Docket No. 36873), asked two research groups at Northwestern University—the Climate Change Research Group (CCRG) of Professor Daniel E. Horton in the Department of Earth, Environmental, and Planetary Sciences and the research group of Professor Pablo Durango-Cohen in the Northwestern University McCormick School of Engineering—to review the merger application, supporting materials, and other information developed in the proceeding to: (1) assess air quality impacts in Englewood, based on changes in activity at the 47th Street Yard projected as a result of the proposed transaction; (2) evaluate how those outcomes may change if Applicants electrify yard trucks; and (3) model health outcomes associated with each scenario. The CCRG uses environmental observations, physics-based numerical modeling, and statistical analyses to study the atmosphere and climate, examining intersecting Earth and environmental systems and their relationships with policies and public welfare[1]. The Durango-Cohen group develops and analyzes optimization and econometric models to study management and operation of transportations systems[2].

This Memorandum explains our findings and details the supporting analyses in relation to those three items. The CCRG analysis was led by PhD student Anastasia E. Oehlerking*, with support from Dr. Libby H. Koolik and Dr. Victoria A. Lang, both postdoctoral fellows in the CCRG, all working under the supervision of Principal Investigator Daniel Horton. The contributions to this Memorandum from the Durango-Cohen group were led by PhD student Callahan Stiles, with contributions from PhD student Samuel Dulin, both working under the supervision of Professor Pablo Durango-Cohen in Northwestern University's McCormick School of Engineering.

Findings

1. Evaluating four sources of NO_x and $PM_{2.5}$ emissions at the 47th Street Yard—yard trucks, cranes, drayage trucks, and locomotives—we found that currently, yard operations release ~16 tons of NO_x and ~ 1.4 tons of $PM_{2.5}$ emissions annually, with locomotives

contributing the most NO_x emissions and trucks (drayage and yard) contributing the most $PM_{2.5}$.

2. Modeling a conservative 20% increase in lifts at the 47th Street Yard five years post-merger and a 36% increase in rail traffic on the related segments, we anticipate annual emissions will increase to at least ~21 tons of NO_x (36% more) and ~1.7 tons of $PM_{2.5}$ (24% more).
3. The estimated post-merger increases in NO_x and $PM_{2.5}$ in Finding 2 are associated with estimated increases in air pollution-related mortality of 24.6-36.5%, adult asthma of 37.0%, and pediatric asthma of 36.7%.
4. Replacing all diesel yard trucks at the 47th Street Yard with electric yard trucks, however, would limit health impacts and only require an ~$8 million investment.
5. Electrifying all yard trucks would limit NO_x emissions increases to 28% (as opposed to 36% without electrification) and $PM_{2.5}$ increases to 1% (as opposed to 24%). For health outcomes, this would limit increases in mortality to 17.1-34.1%, adult asthma to 34.5%, and pediatric asthma to 34.3% as compared to the post-merger scenario without electrification.

Background

CCRG and the Durango-Cohen group have reviewed the statements regarding air quality in the Revised Application and the environmental information submitted to the Office of Environmental Analysis. The plans reported in these materials indicate that the proposed Union Pacific-Norfolk Southern (UPNS) merger would bring a surge of rail, truck, and yard activity to Englewood[3]. Increased shipping activity at the 47th Street Yard means more emissions from diesel-fueled internal combustion engines, which include emissions of $PM_{2.5}$ and NO_x. These pollutants, and other secondary compounds they can form in the atmosphere, are harmful to human health. $PM_{2.5}$ exposure is associated with cardiovascular and respiratory disease[4,5], lung cancer, and premature mortality, and NO_2 exposure with asthma incidence and exacerbation and other respiratory effects, as well as premature mortality[6–8].

The Amended Application reports estimates of nationwide CO_2, NO_x, and PM reductions[9], but these nationwide figures offer no insights into air quality changes in individual neighborhoods or at specific yards. Because pollutant concentrations can fall off sharply with distance from their source, coarse regional totals can show very little change when the people living within a few hundred meters of a yard see a meaningful impact[10]. Englewood is an especially at-risk community, with the highest rate of baseline all-cause mortality in Chicago[11], resulting, in part, from cumulative pollution exposures from converging rail networks and the neighboring Dan Ryan Expressway. Any change in emissions from the 47th Street Yard puts this already at-risk community at an even greater vulnerability to pollution-related morbidity and mortality. Therefore, analyses addressing changes in neighborhood-scale air pollution from the

47th Street Yard and surrounding neighborhoods are critical to assess the environmental impacts of the proposed UPNS merger on Englewood.

Our analysis began with estimating emissions associated with truck, train, and yard activity at the 47th Street Yard. To develop those estimates, we analyzed the 3 following scenarios:

Baseline: Using publicly available information, public application materials, and independent modeling, we approximated 2025 shipping activity related to the 47th Street Yard.

Consolidation: We modeled "post-merger" conditions as 5 years from baseline, or 2030. We assumed a very conservative 20% increase in lifts per day at the 47th Street Yard (Applicants estimate 30% growth within 3 years post-merger) and ~41% increase in rail ton-miles on the rail segments associated with the yard.

Electrification: We modeled air emissions under the Consolidation scenario but with all of the diesel-fueled yard trucks at the 47th Street Yard replaced with battery-electric trucks.

Once we had emissions estimates, we modeled the spatial distribution of pollutant concentrations surrounding the 47th Street Yard for each of these scenarios. Finally, using this spatial information, we estimated the health outcomes associated with these concentration changes in the census tracts at and surrounding the 47th Street Yard.

The following sections describe the model assumptions and setup, source characterization, electrification analysis, resulting emissions and pollutant concentration changes, and health impacts.

To assess hyperlocal air pollution impacts, CCRG used AERMOD[12], the U.S. Environmental Protection Agency's (EPA) preferred regulatory model for near-field dispersion, and a standard tool for permitting and environmental assessment of rail yards, industrial plants, and other major emission sources[13,14]. AERMOD is a physics-based Gaussian plume model that resolves annually averaged concentrations of primary pollutants at the neighborhood scale, which allows us to assess long-term exposure and associated health risks in Englewood. We assess the yard's major quantifiable emission sources (yard trucks, cranes, drayage trucks, and mainline rail) and three scenarios related to the potential merger[15] to estimate how annual air quality would change in Englewood, Chicago, and neighboring communities.

Methodology

Activity & Emissions Estimates

As described below, the Durango-Cohen Group estimated activity and emissions data for the following sources: yard trucks, drayage trucks, and cranes. Using train activity estimates from the Durango-Cohen Group, CCRG estimated train emissions.

Yard trucks and drayage trucks

To estimate truck emissions, we used a discrete-event simulation model of an intermodal rail yard that was informed by two other intermodal rail yards that we were able to tour as a project team in 2024. These yards are both near Joliet, IL. One is operated by Union Pacific, and the other is operated by BNSF. These yards are not exactly the same as the NS 47th Street yard, but they use a similar set of equipment, including gantry cranes, reach stackers, and yard hostlers, as the primary equipment handling containers being considered in the operations of the simulation model. The model was built using MATLAB Simulink[16], and developed under the ARPA-E INTERMODAL project that finished in 2026[17]. The model estimates the quantities and types of equipment required for the facility to operate in different scenarios. It tracks the flow of containers through the rail yard by implementing the containers as entities that are served by the cranes and yard trucks to ultimately move the containers between the trains and drayage trucks that enter the yard. This type of model handles the interactions between multiple processes to realistically simulate the operations of a facility like this.

An additional key aspect of the model is that it accounts for refueling or charging process for diesel-fueled or electric yard trucks. This makes it possible to test the tradeoffs of transitioning from diesel-fueled yard trucks to battery-electric yard trucks that require new charging infrastructure and take longer to charge than the diesel-fueled trucks take to refuel.[18]

Truck Estimates

The equipment estimates from our model under Baseline and Consolidation scenarios are reported in Table 1 below. To approximate Baseline (2025) yard and drayage truck activity at the 47th Street Yard, we estimated the shipping volume to be 500,000 lifts per year, as reported by CMAP in 2024[19]. For the Consolidated scenario, we estimated a 20% increase to 600,000 lifts per year. The model yielded a yard-truck count based on these volumes—24 yard trucks under the Baseline and 32 yard trucks under the Consolidated scenario—accounting for refueling times and representing an equipment decision made by the yard operator. The drayage trucks volume is estimated to be 1 truck visit per lift, which is a logical assumption based on yard operations, but it is also backed up by an EPA report about the Port of Oakland[20]. As such, for the Baseline scenario, we estimate 500,000 drayage truck entries per year and for the Consolidated scenario, we estimate 600,000 per year.

Table 1. Yard and Drayage Truck Equipment Counts at 47th Street Yard

Scenario	Yard Trucks	Drayage Trucks
Baseline	**24**	**500,000/year**
Consolidated	**32**	**600,000/year**

For the Electrification scenario, we considered electrification of all yard trucks, as they are currently one of the most cost-effective and easy to implement emission-reduction measures deployed at yards across the country. Zero-emission yard-truck usage accounted for 43% of all compliance activity under the WAIRE program in Southern California, whereas near-zero-emission truck visits and infrastructure improvements represented 27% and 9%, respectively.[21] Hostler usage accounted for 54% of all compliance activity in 2021, the first year after the program was implemented, indicating that hostler usage and acquisition accounted for the majority of early-stage emission-reduction efforts in Southern California warehouses.[21] This is likely because battery-electric yard trucks are cheaper and easier to implement than alternatives. First, yard trucks operate on short routes, in fixed locations near charging infrastructure, with predictable duty cycles, and in controlled environments – making them extremely suitable for battery-electric technology.[65] Second, drayage trucks, in addition to facing technological challenges, are 80% owner-operated at intermodal facilities. Applicants cannot control the acquisition of low-emission drayage trucks[66] whereas they have full control over the infrastructure and cargo-handling equipment of their intermodal rail yard. Third, battery-electric hostler trucks have a lower up-front capital cost than other electrified equipment.[67,68] Additionally, while hostler trucks do have a higher capital cost than their diesel counterparts, as is typical for low and zero-emission technologies, they have lower maintenance costs as well.[52,67] Part of our electrification analysis models the cost of implementing battery-electric yard trucks at the 47th Street Yard across the twelve-year lifespan of a diesel yard truck.

For the Electrification Scenario, the INTERMODAL model estimated the number of battery-electric yard trucks necessary to handle the 500,000 lifts per year under the Baseline and 600,000 lifts per year under the Consolidated scenario, accounting for recharging time. The result was 42 battery electric trucks required to replace 32 diesel handling the same volume of shipping activity.

Table 2. Yard Truck Diesel to Electric Conversion Count Estimates at 47th Street Yard

Scenario	Diesel Yard Trucks	Battery-Electric Yard Trucks
Baseline	**24**	**31**
Consolidated	**32**	**42**

We estimated emissions as follows. For yard trucks, we conservatively estimated 2500 operating hours per year based on a California Air Resources Board Report[22]. For the drayage trucks, we focused on emissions when these trucks are at the yard and estimated the hours the trucks would operate within the yard. The conservative estimate used was 45 minutes total at the 47th Street Yard, with 15 minutes being idle and 30 minutes moving at slow speeds using the method in a report available from the EPA completed on equipment activity in the Port of Oakland[20]. Finally, using these operating hours, we applied the following emissions factors, to estimate tons of emissions per year. For yard trucks, the Durango-Cohen Group's diesel CO_2 emission factors came from the EPA GHG Emission Factors Hub[23], and battery-electric hostler emissions were based on grid electricity emission factors from EPA's eGRID summary data[24]. For drayage trucks, emission factors came from EPA's Exhaust Emission Rates for Heavy-Duty Onroad Vehicles report[25]. Emissions of all other pollutants (including NO_x and $PM_{2.5}$) for these sources were derived from the CO_2 estimates using the Economic Input-Output Life Cycle Assessment (EIO-LCA) model[26], which applies economic input-output tables to the EPA's

supply chain greenhouse gas emission factors built on the US Environmentally-Extended Input-Output (USEEIO) model[27].

Crane Estimates

To estimate crane activity, we assumed 5 diesel-electric hybrid gantry cranes as reported by NS in 2022[28], and 7 cranes that are a combination of reach stackers and sideloaders, reported by NS in 2024[29], yielding at least 12 cranes.

Norfolk Southern provided information on the estimated annual emissions of 75 tons of CO_2 for each diesel-electric hybrid gantry crane in 2023, so we used that for our baseline case for each of the 5 gantry cranes[30]. For the reachstackers and sideloaders, we treated them as the same type of equipment and estimated the annual operating hours to be 2,500 in the baseline case as another conservative estimate based on CARB 2023[22], as reported in Table 3.

Table 3. Non-Gantry Crane Annual Operating Hours at 47th Street Yard

Scenario	Reachstackers and Sideloaders (7)
Baseline	**17,500**
Consolidated	**21,000**

To estimate emissions, electric gantry crane emissions were based on Norfolk Southern's sustainability reporting[31]. Diesel emissions from reach-stacker and sideloader cranes were based on estimates of CO_2 emissions and energy use at container terminals[32], and hybrid equipment estimates came from industry reporting on hybrid-powered container handling[33].

Rail Estimates

For mainline rail, the Durango-Cohen Group provided CO_2 emission estimates and activity in ton-mile per rail segment at a 2025 baseline and 5 years post-merger, as described in its memorandum "Re: STB Docket No. 36873: Traffic Near Englewood After the UP-NS Merger," dated November 18, 2026. CCRG used the estimated baseline of 56.2 million gross ton-mile (GTM) on rail segments touching 47th Street Yard pre-merger and 79.1 million GTM post-merger, but clipped the rail activity data to include only activity occurring at the portions of those segments within the yard perimeter. This yielded 36.8 million in-yard GTM pre-merger and 52.2 million in-yard GTM post-merger. For NO_x and $PM_{2.5}$, CCRG estimated rail emissions using g/gal conversion factors from the 2022 National Emissions Inventory Locomotive Methodology[34] alongside fuel efficiency estimates from the Association of American Railroads.[35]

AERMOD's Modeling System

This section describes the CCRG's spatial air pollutant concentration modeling informed by emissions estimates and activity data.

AERMOD Preprocessing Models

AERMOD requires meteorological and terrain input[12]. Since Englewood is predominantly flat with few-to-no tall buildings (4 stories or higher) upwind of the prominent wind direction (Fig. B1), we did not include terrain in our analysis. We ran two of AERMOD's preprocessing models to simulate average meteorological conditions. First, we ran AERSURFACE[36], which is an EPA tool that takes inputs of digital land cover data from the National Land Cover Database[37,38] to calculate the surface characteristics required to run AERMET[39], the meteorological preprocessor for AERMOD. We then input 2024 meteorological data from the National Weather Service for Midway International Airport (KMDW)[40] – the closest meteorological station to the 47th Street Yard (~10km from the yard) – alongside upper-air weather balloon data from the Quad Cities Weather Forecasting Office (KDVN)[41], in Davenport, IA, the nearest upper-air observing station to the 47th Street Yard, to estimate upper-air conditions at the site. Information on the AERMET output used for AERMOD analyses can be found in Appendix B.

AERMOD Overview

AERMOD is a steady-state Gaussian plume dispersion model developed by the EPA and the American Meteorological Society[12]. AERMOD estimates ground-level pollutant concentrations by treating an emissions plume as a normal distribution in the horizontal direction and, under convective conditions, a Gaussian distribution in the vertical, with plume spread determined by hourly boundary-layer turbulence and stability derived from AERMET[12]. Because it resolves concentrations at the scale of tens to hundreds of meters, AERMOD is well suited for annualized, hyperlocal analyses of near-source exposure, which is the focus of our work assessing changes at the 47th Street Yard[42,43].

Model Configuration

All runs in this analysis used AERMOD version 26135, with the flat-terrain option, consistent with our decision to exclude terrain, and an annual averaging period over the full 2024 meteorological record. Because the Chicago metropolitan area has a large urban heat island that augments nighttime atmospheric mixing, we enabled AERMOD's urban option with a population of 2,746,388 for the City of Chicago[44], and applied it to all runs. We used the surface and profile files produced by AERMET (Appendix B) for KMDW surface observations and KDVN upper-air soundings, with a base elevation of 188.0 m, the elevation of the KMDW meteorological tower[40].

Receptor Network

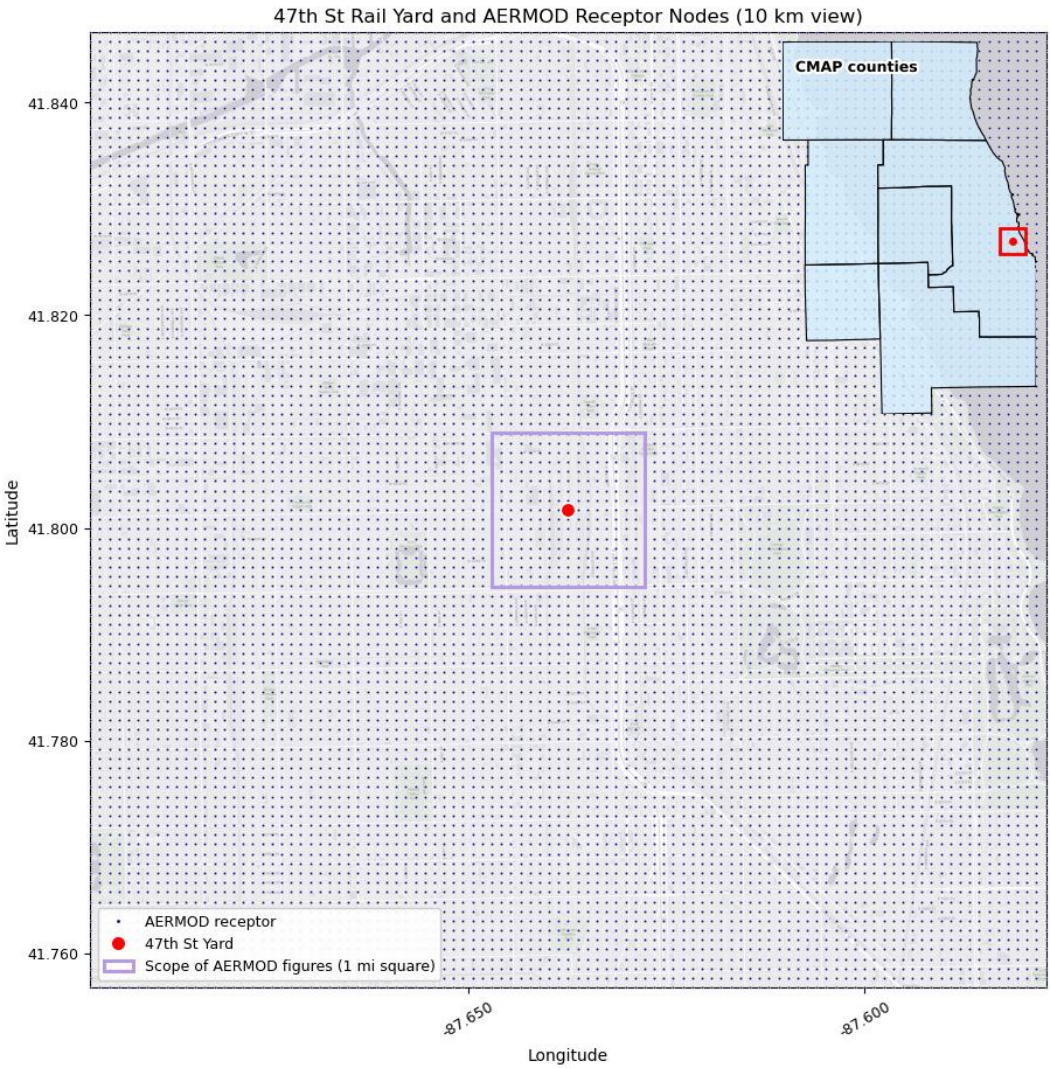

Figure 1. Schematic of the full AERMOD receptor grid (10 km^2), the relative location in Chicago (the counties under the jurisdiction of the Chicago Metropolitan Agency of Planning (CMAP)), and the bounding box for the AERMOD analyses to follow (1 mi^2).

Concentrations were calculated on a uniform Cartesian grid of receptor nodes centered at the 47th Street Yard (41.801701°N, 87.637364°W). The AERMOD grid extends ±5,000 m in both directions, with 100 m spacing, giving 101 × 101 = 10,201 nodes (Figure 1, Figure A5). Receptors were placed at a height of 1.5 m above ground, representing the breathing zone height of a standing adult[45,46]. Node coordinates are relative to the grid origin and were converted to latitude and longitude for mapping.

Unit-Emission (χ/Q) Approach

Rather than modeling each pollutant (NO_x, $PM_{2.5}$) and scenario separately, we ran each source with a total area-weighted emission rate of 1 g/s and used the resulting concentrations as a scaling factor, χ/Q[14]. The AERMOD output is in µg/m³ per g/s, or concentration per release flux. Because dispersion is proportional to the emission rate for non-reactive pollutants, the concentration of any pollutant is the product of the χ/Q field and that pollutant's emission rate:

$$C(x,y) = \frac{\chi}{Q}(x,y) \times Q$$

where C is the concentration at a given receptor node (µg/m³*),* χ/Q is the modeled concentration per unit emission, output from AERMOD [(µg/m³) per (g/s)], and Q is the total emission rate (g/s) of the source for each pollutant-scenario combination. We set up the model with an area-normalized unit emission rate (1 g/s) for each source, so that each pollutant and each pre- and post-merger scenario requires varying only the emissions vector (Q) applied to the same χ/Q fields. We converted mass concentrations to mixing ratios where needed, using the molar volume at 25 °C and 1 atm and each pollutant's molecular weight, where we report NO_x concentrations as ppb and $PM_{2.5}$ as µg/m^3. Secondary pollutants, including ozone and secondary $PM_{2.5}$, are not modeled; we discuss this in the Limitations section.

Source Characterization

Each source type was represented with the AERMOD source type that best matches its geometry, largely based on prior geometry-based rail yard analyses performed for California by ENVIRON[13,14]:

- **Yard trucks:** area source: a circle of 200 m radius centered 400 m south of the origin; release height 0.6 m, initial vertical condition of 0.14 m[14]
- **Cranes:** five area sources at surveyed crane locations: 0.2 g/s each, release height of 3.90m and initial vertical condition of 0.91m[14]
- **Mainline rail:** RLINE sources along the rail segments within the yard perimeter, with the 1 g/s flux spatially allocated by the simulated locomotive activity at each rail link derived by the Durango-Cohen group
- **Drayage trucks:** RLINE sources along the road segments within the yard perimeter, with the 1 g/s flux distributed evenly between roadways, release height of 3.48 m, initial vertical dispersion of 3.24 m[47–49]

Electrification Analysis

CCRG evaluated spatial distribution of emissions with resulting pollutant concentrations and their health impacts for three scenarios: Baseline, Consolidation, and Electrification. The emissions inputs for the Baseline and Consolidation scenarios are described above, and this section describes the Electrification scenario.

The Durango-Cohen Group applied the MATLAB intermodal yard model previously described under the Consolidation scenario to determine equipment needs if all diesel yard trucks were replaced with electric trucks, accounting for recharging time. The result was that 42

battery-electric yard trucks would be required to handle growth to 600,000 lifts per year, replacing 32 diesel yard trucks that would be required for the same volume. More battery-electric yard trucks are required due to longer times to charge the batteries compared to refueling diesel-powered yard trucks.

Results

We report yard-attributable NO_x and $PM_{2.5}$ concentrations, and estimated health impacts for three scenarios: baseline, consolidation, and yard-truck electrification.

All concentrations are primary-pollutant annual averages at 1.5 m receptor height. Yard-attributable concentrations are compared with baseline ambient concentrations in the 12 km grid cell containing the yard (Appendix A), which are 6.49 $\mu g/m^3$ for NO_2 and 13.46 $\mu g/m^3$ for $PM_{2.5}$[50]. Source emission rates for each scenario come from the Durango-Cohen group's activity estimates.

Source emission rates convert from annual totals as:

$$Q\ (\mathrm{g/s}) = \frac{E\ (\mathrm{t/yr}) \times 10^6\ \mathrm{g/t}}{31{,}536{,}000\ \mathrm{s/yr}}$$

Baseline Scenario

In the information below, we examine the emissions plumes from our sources of interest (yard trucks, cranes, drayage, and mainline rail), their characteristics relative to the Englewood yard, before analyzing how these plumes change under our emissions scenarios in future sections.

We also contextualize the baseline scenario by semi-quantitatively comparing our modeled results to baseline concentrations modeled in a comprehensive chemical-transport model with a complete emissions inventory[51]. These concentration estimates are not directly comparable, but for context, they are provided in Appendix A.

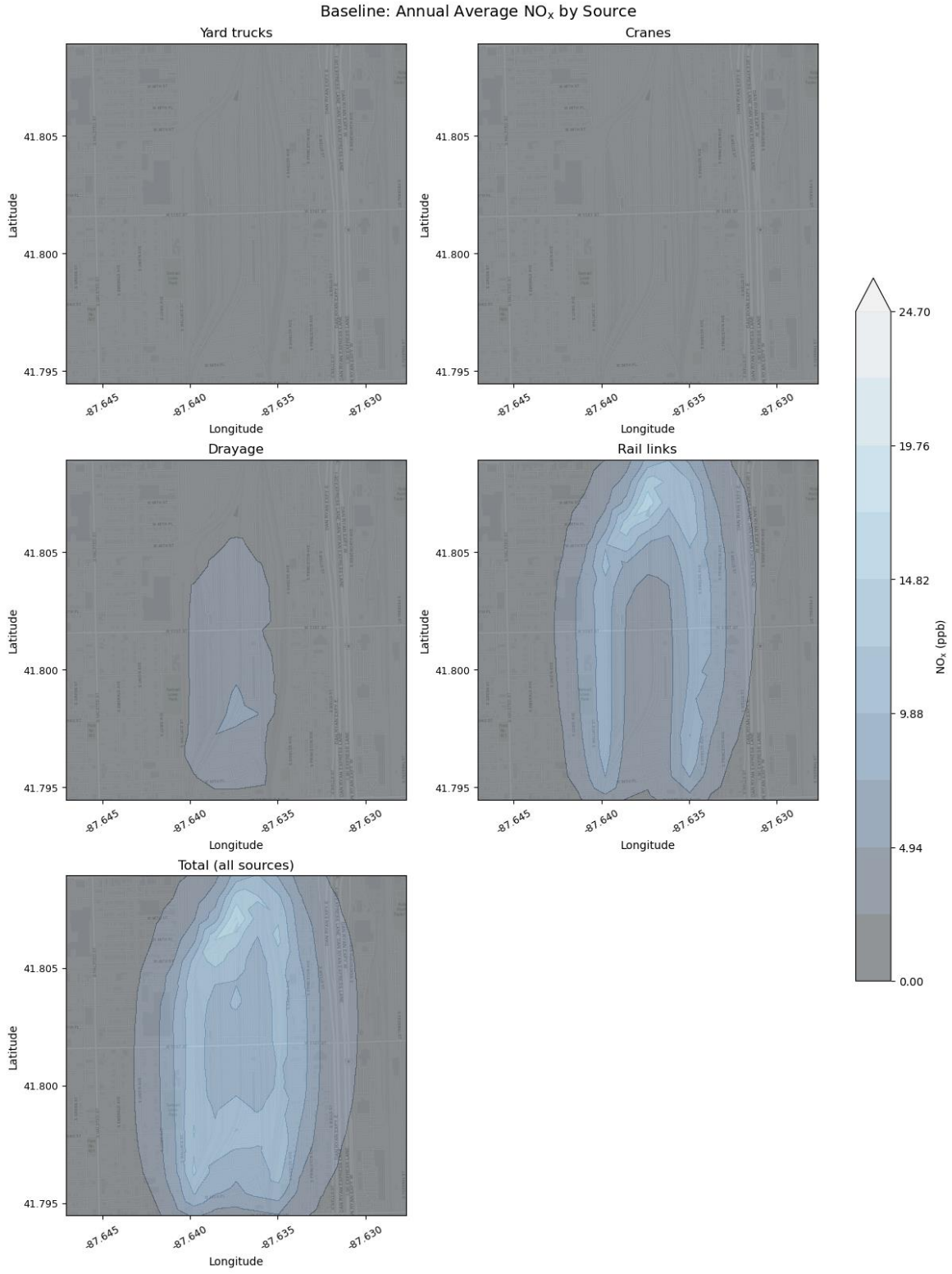

Figure 2. Baseline 47th Street Yard attributed NO_x concentrations, by source, and aggregated.

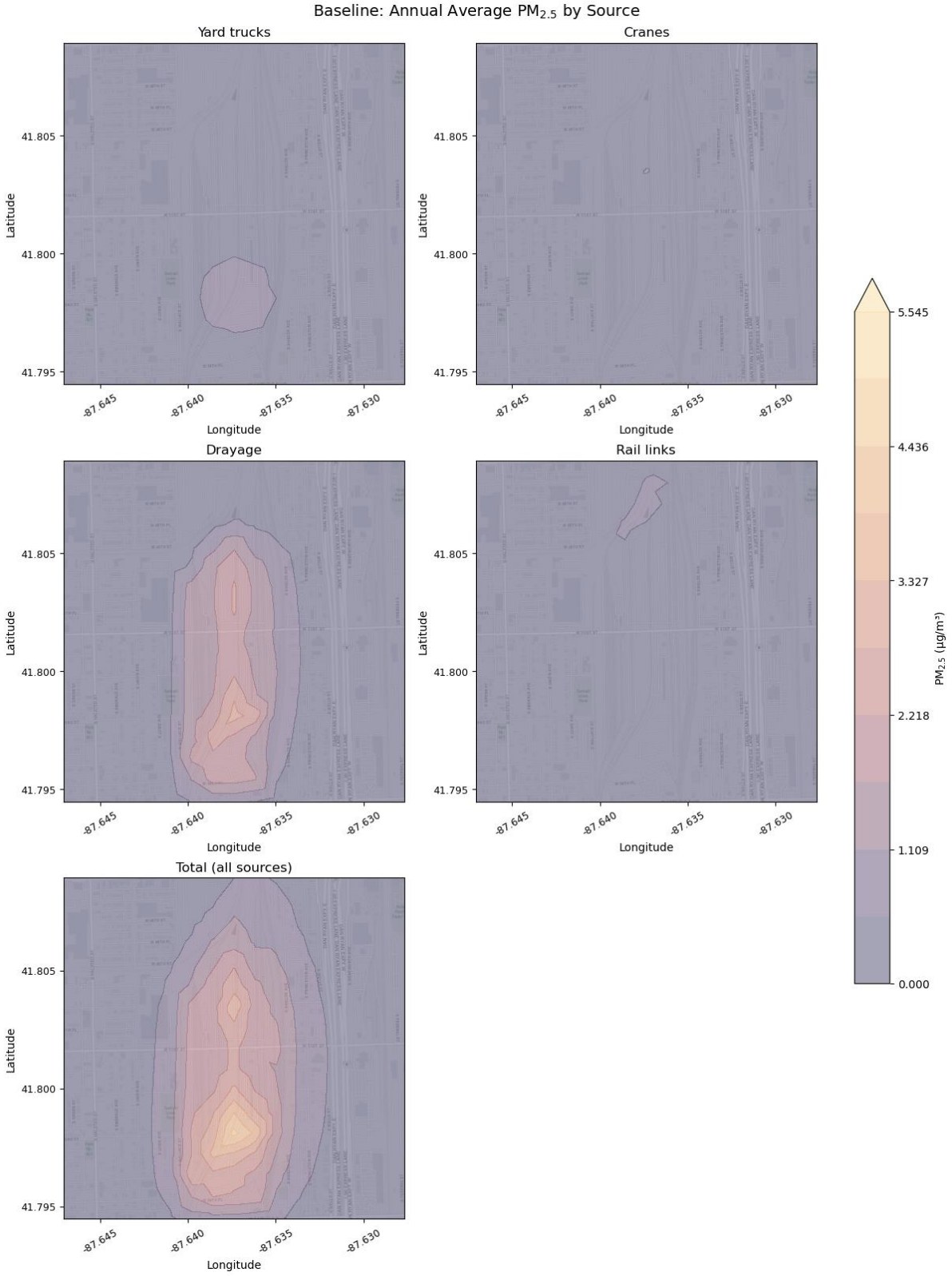

Figure 3. Baseline 47th Street Yard attributed $PM_{2.5}$ concentrations, by source, and aggregated.

In this analysis, we find that mailine rail contributes the largest share of yard NO_x emissions, whereas drayage trucks contribute the most to $PM_{2.5}$.

Table 4. Baseline emissions and maximum annualized concentrations (at any receptor node within the 10 km^2 AERMOD domain) by source.

Source	NO_x emissions (t/yr)	$PM_{2.5}$ emissions (t/yr)	Max NO_x concentration (ppb)	Max $PM_{2.5}$ concentration (µg/m³)
Yard trucks	1.50	0.398	1.8	0.91
Cranes	1.08	0.286	1.2	0.62
Mainline rail	11.40	0.279	16.7	0.77
Drayage trucks	1.60	0.426	6.0	2.98
Total	*15.57*	*1.389*	*17.6*	*4.59*

Consolidation Scenario

Shifting UPNS activity from the UP Yard Center yard to 47th Street changes yard NO_x emissions by 13.7% and $PM_{2.5}$ emissions by 18.3% relative to baseline, raising maximum annual-average NO_x concentrations to 24.7 ppb and $PM_{2.5}$ to 5.55 µg/m^3.

The largest concentration increases occur within the yard, but some pollution shifts slightly east, consistent with the prevailing winds from the west (Figure B1).

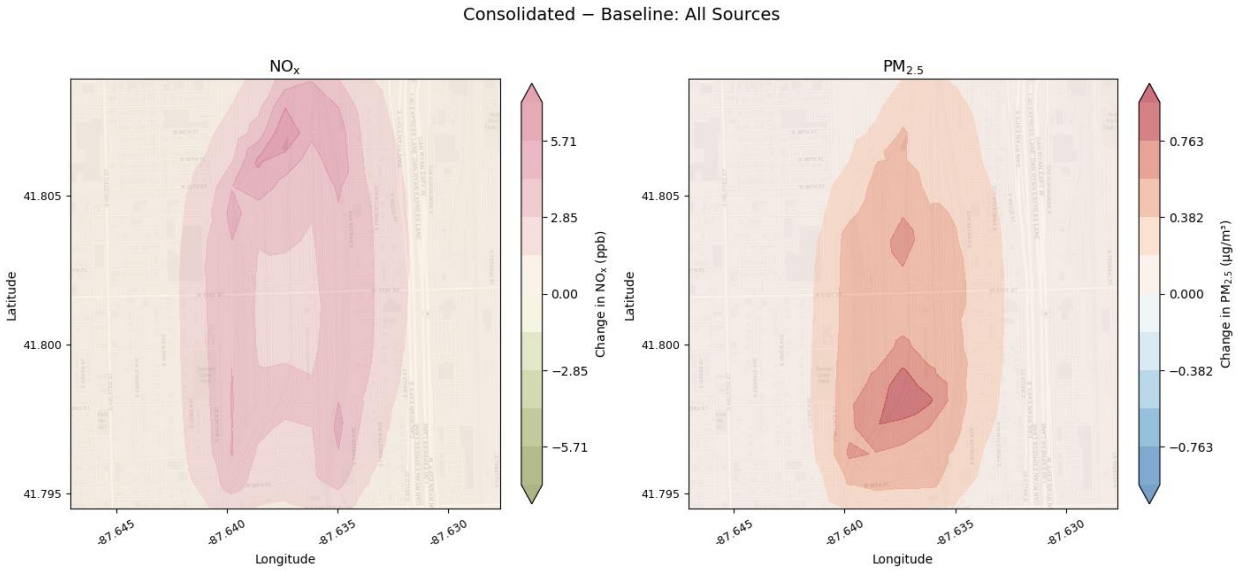

Figure 4. Difference between the total emissions from the consolidation scenario and the yard baseline for NO_x and $PM_{2.5}$.

Table 5. Consolidation emissions and concentrations by source.

Source	**NO_x emissions (t/yr)**	**NO_x change vs. baseline (%)**	**$PM_{2.5}$ emissions (t/yr)**	**$PM_{2.5}$ change vs. baseline (%)**	**Max NO_x conc. (ppb)**	**Max $PM_{2.5}$ conc. (µg/m³)**
Yard trucks	1.79	20.0	0.477	20.0	2.2	1.09
Cranes	1.29	20.0	0.343	20.0	1.5	0.74
Mainline rail	16.14	41.6	0.395	41.6	23.7	1.09
Drayage trucks	1.92	20.0	0.511	20.0	7.1	3.58
Total	*21.15*	*35.8*	*1.727*	*24.3*	*24.7*	*5.55*

Electrification Scenario

The electrification scenario assumes replacement of ***all*** diesel yard trucks with battery-electric trucks because this is a feasible and cost-effective strategy for reducing emissions, as discussed above.

In Table 6 below, the Durango-Cohen Group presents a cost comparison of the diesel or an electric yard truck fleet required to handle post-merger 600,000 lifts/year at the 47th Street Yard. The assumptions made in this cost assessment are the same as the ones made in the paper for the discrete-event simulation model[18]. Assumptions are stated in Appendix G. A cost comparison with a 12-year net present value (NPV) is included as the expected lifespan of a battery-electric yard truck is listed as 12 years in this report by the North American Council for Freight Efficiency in 2022[52]. The capital costs of installing the necessary charging infrastructure are included in the battery-electric yard truck case. The electrification case includes 20 charging stations as determined by the simulation model. Given that the charging infrastructure remains in place, the next round of purchasing battery-electric yard trucks would become more cost effective as the upfront capital costs would be lower. The real discount rate is assumed to be 7%. The other assumptions for this analysis are included in Appendix G. This yields an approximately $8 million net cost of electrifying yard trucks.

Table 6. Example Cost Comparison for Yard Truck Electrification Scenario

Yard Trucks	Capital Cost	Annual Operating and Maintenance Cost	12-year NPV
32 Diesel	$5.12M	$2.81M	$27,438,948
42 Battery-Electric	$20.64M	$1.86M	$35,413,397

To understand the benefits, we estimated the emissions changes. Electrifying yard equipment under the consolidation activity level reduces yard NO_x emissions by 5.8% and $PM_{2.5}$ emissions by 18.8% relative to the consolidation scenario, and increases yard NO_x and $PM_{2.5}$ emissions by 28.0% and 1.0%, respectively, relative to baseline.

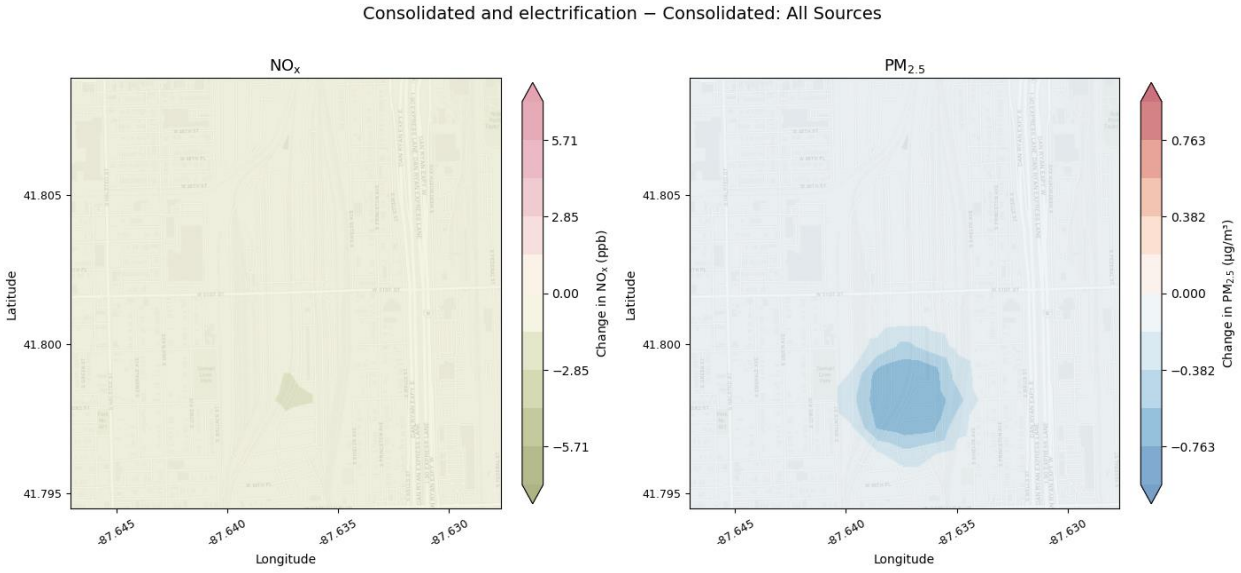

Figure 5. Difference between the total emissions from the consolidation-electrification scenario and the consolidation scenario for NO_x and $PM_{2.5}$. Here, 100% of yard trucks are electrified.

Table 7. Electrification scenario emissions and concentrations by source, versus consolidation. Here, 100% of yard trucks are electrified.

Source	NO_x emissions (t/yr)	NO_x change vs. consolidation (%)	$PM_{2.5}$ emissions (t/yr)	$PM_{2.5}$ change vs. consolidation (%)	Max NO_x conc. (ppb)	Max $PM_{2.5}$ conc. (µg/m³)
Yard trucks	0.58	-67.9	0.153	-67.9	0.7	0.35
Cranes	1.29	0.0	0.343	0.0	1.5	0.74
Mainline rail	16.14	0.0	0.395	0.0	23.7	1.09
Drayage trucks	1.92	0.0	0.511	0.0	7.1	3.58
Total/Difference	*19.93*	*-5.8*	*1.402*	*-18.8*	*24.7*	*4.81*

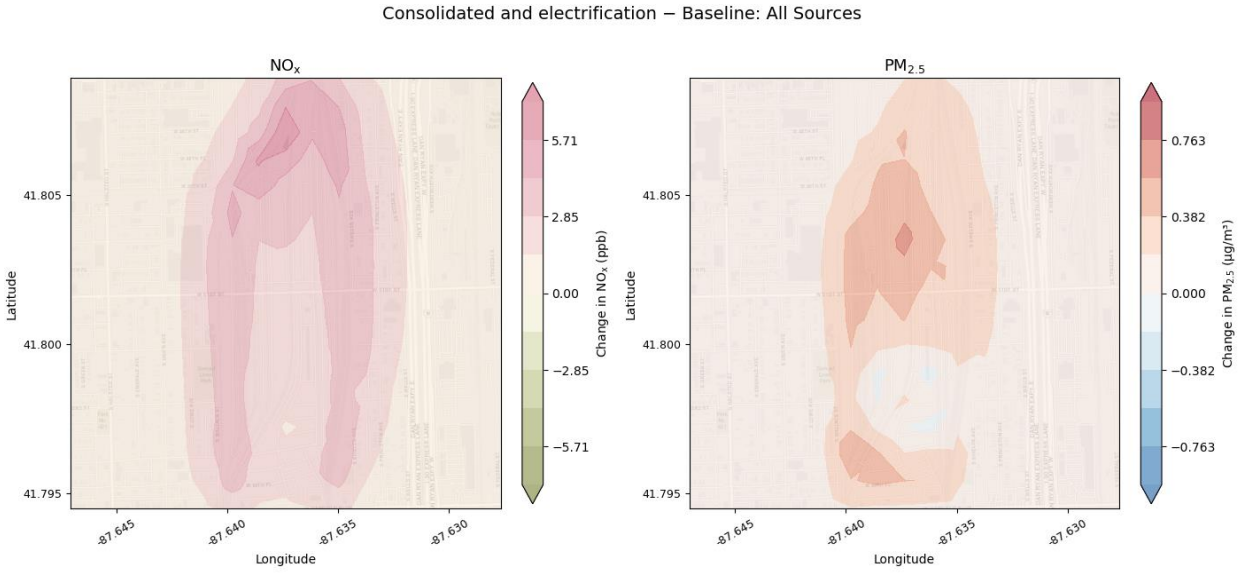

Figure 6. Difference between the total emissions from the consolidation-electrification scenario and the yard baseline for NO_x and $PM_{2.5}$. Here, 100% of yard trucks are electrified, following the consolidation scenario.

Table 8. Electrification scenario emissions and concentrations by source, versus baseline. Here, 100% of yard trucks are electrified, following the consolidation scenario.

Source	NO_x emissions (t/yr)	NO_x change vs. baseline (%)	$PM_{2.5}$ emissions (t/yr)	$PM_{2.5}$ change vs. baseline (%)	Max NO_x conc. (ppb)	Max $PM_{2.5}$ conc. (µg/m³)
Yard trucks	0.58	-61.5	0.153	-61.5	0.7	0.35
Cranes	1.29	20.0	0.343	20.0	1.5	0.74
Mainline rail	16.14	41.6	0.395	41.6	23.7	1.09
Drayage trucks	1.92	20.0	0.511	20.0	7.1	3.58
Total/Difference	*19.93*	*28.0*	*1.402*	*1.0*	*24.7*	*4.81*

Overall, we find that emissions increase under the post-merger consolidation scenario, and electrifying yard trucks ameliorates some of the in-yard emissions, especially $PM_{2.5}$, but does not completely counteract the emissions increase from the post-merger consolidation.

We also explore the social cost of carbon related to in-yard emissions, found in Appendix F.

Health Impacts

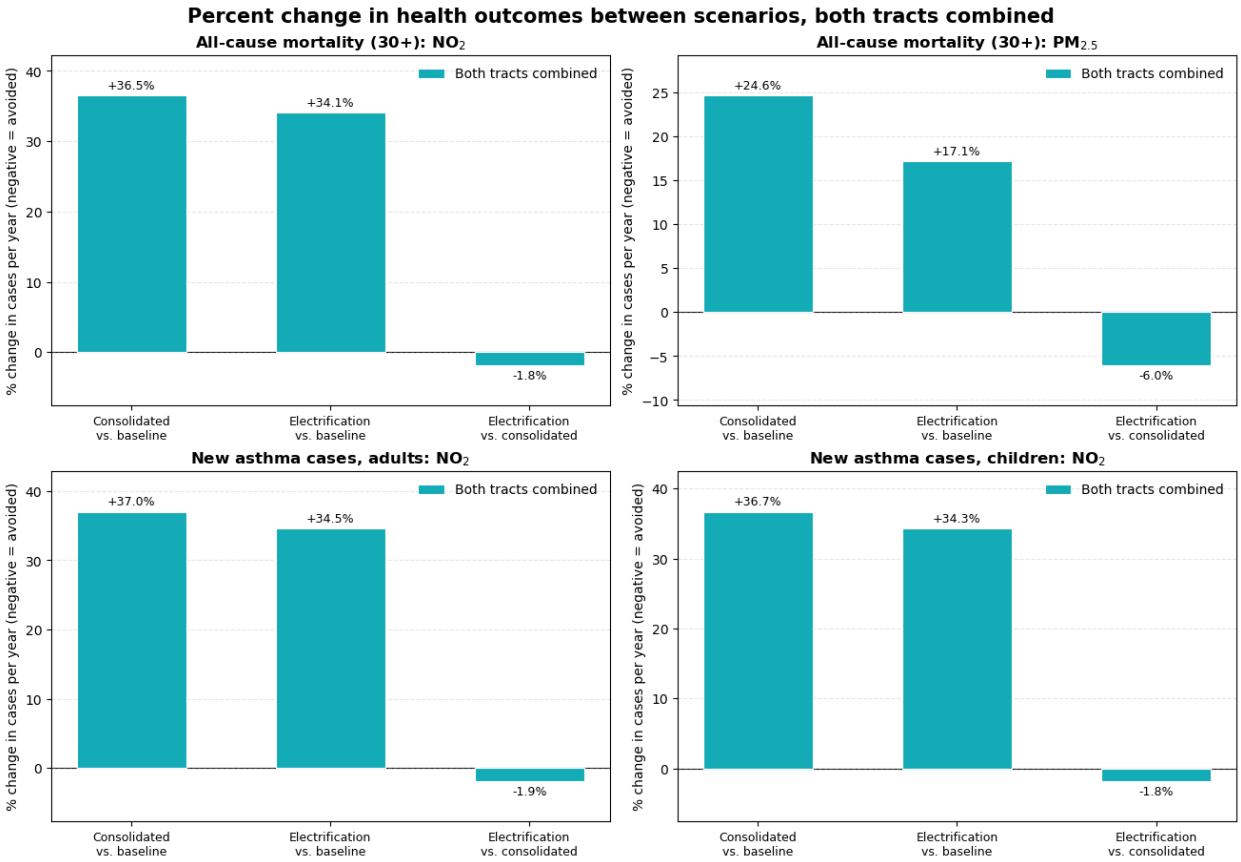

Figure 7. Difference in health outcomes between consolidation and consolidation-electrification scenarios with the baseline scenario and each other.

We estimated changes in all-cause mortality and new cases of asthma attributable to yard-related $PM_{2.5}$ and NO_2 in two Cook County census tracts, 8356 and 8438, using a log-linear concentration-response function used by the Health Effects Institute (HEI)[53]. We estimate NO_2 using a NO_2/NO_x ratio of 0.787 from EPA monitor 17-031-0076 annual average concentrations for 2024[54]. We also inspect health impacts for NO_2/NO_x ratios of 0.5 and 0.9, as recommended by 40 CFR Part 51 Appendix W for AERMOD analyses, and is used in AERMOD modeling by the South Coast Air Quality Management District in California[55,56]. As NO_2/NO_x ratios are highly variable and are dependent on ozone chemistry, this acknowledges uncertainty and seasonality of our health estimates[57]. High (0.9) and low (0.5) NO_2/NO_x health incidence estimates are found in Appendix E.

Using HEI's recommended response functions, we look at the increased likelihood of a given health burden (mortality or asthma) per incremental increase in ambient exposure to each pollutant. Pollutant inputs come from the AERMOD-derived annual-average concentrations attributable to the yard's sources in each tract under three scenarios (baseline, consolidation, and

consolidation with electrification), age-stratified baseline mortality incidence from BenMap[58], tract population by age from the 2015–2019 American Community Survey five-year estimates (obtained through NHGIS)[59]. Relative risks (RR) and their confidence intervals came from HEI[53]. We also restrict our mortality estimates to ages 30 and older[60]. NO_2 concentrations were expressed as mixing ratios (ppb), as with the rest of our analyses. For each RR with increment ΔC_a (the concentration change the RR corresponds to), we calculated the coefficient

$$\beta = \frac{\ln(\mathrm{RR})}{\Delta C_a}$$

and, for a change in annual-average concentration ΔC_t in tract t, the attributable fraction

$$\mathrm{AF}_t = 1 - e^{-\beta\,\Delta C_t}$$

The number of health events in tract t is then summed over age groups a:

$$N_t = \sum_a I_{t,a}\ P_{t,a}\,\mathrm{AF}_t,$$

where $I_{t,a}$ is the baseline annual incidence rate (mortality or asthma) and $P_{t,a}$ is the population in age group a. For asthma, β differs for children (under 18) and adults. We calculated our health estimates alongside lower and upper bounds by using the RR and its 95% confidence limits, and we summed the tract totals so that results cover both tracts of interest.

We evaluated two kinds of comparison. Scenario comparisons use the difference in yard-attributable concentration between scenarios, ΔC_t, such that positive values are additional cases per year and negative values are avoided cases. Burden estimates use the scenario's yard-attributable concentration relative to a counterfactual scenario of no yard emissions, and give the health events attributable to the yard under each scenario on the ~1600 residents of the two target census tracts. For example, under the baseline, yard-related NO_2 is associated with about ~1.1 additional deaths *per year* across the two tracts, and consolidation raises this by about ~0.4, while electrification of yard trucks offsets part of that increase (-0.04 deaths per year relative to consolidation). Estimated effects for $PM_{2.5}$ are smaller, yet present, with about ~0.2 deaths per year associated with baseline yard activities. More information on the health analysis results can be found in Appendix E.

Limitations

Secondary pollutants. AERMOD neglects secondary chemistry that forms health-harming pollutants such as secondary $PM_{2.5}$ and ozone. We do not model the oxidation of NO to NO_2, nitrate, or ozone, or the formation of secondary $PM_{2.5}$ from NO_x and other precursors, which occurs downwind and at regional scales. This is an important caveat for the Chicagoland region, which is in nonattainment for ozone. Our results therefore likely underestimate total exposure to pollution attributable to the yard.

Domain, terrain, and meteorology. We modeled flat terrain over a 10km^2 receptor domain centered on the yard, and our results should not be extrapolated to regional scales, where chemical transformation and transport matter more. We also used a single year (2024) of meteorology from KMDW, which does not capture interannual variability. Regulatory practice generally calls for a multi-year record, and South Coast AQMD guidance cites five years as their recommendation.

Annualization of impacts. AERMOD results here are annual averages, with emissions held constant across hours, days, and seasons. Annualization masks short-term peaks, such as calm, stable nights, seasonal differences (Appendix A, Figure A6), and extreme events, and so does not represent acute exposures. One such example is the lake breeze in Chicago, which air quality models have historically been unable to reproduce[61]. Our baseline ambient concentrations are a Jan/Jul mean from 2019, which only approximates an annual average and comes from a different year than our 2024 meteorology. We acknowledge this in our analysis and simply use the 2019 data for a general comparison.

Activity Modeling. The yard-activity model we use is based on activity at a different rail yard, and as every yard has different characteristics (infrastructure, demand, layout, vehicle composition), this model may not perfectly reflect activity at the 47th Street Yard.

Spatial allocation of emissions. Each source's emissions are distributed using simplified geometries: yard trucks across a 200 m radius circle, cranes equally among five surveyed locations (from June 8, 2024), drayage trucks uniformly per meter of road segment (not weighted by traffic), and rail by simulated locomotive activity. Yard truck, crane, and drayage truck allocations were derived using Google Earth and are subject to user error. Merger scenarios change only the emission rate (Q) applied to these same footprints, so shifts in where activity occurs, such as new routing, queuing, or idling hot spots, are not represented in our analysis. Concentrations near the yard boundary are sensitive to these assumptions, and are likely not entirely captured with our methods. We also constrain external drayage truck emissions to only include activity within the yard perimeter, similarly for rail segments. This does not fully capture rail-associated activity in the area, just in the yard.

Sources not included. We model yard trucks, cranes, drayage trucks, and mainline rail. The merger could also change yard-side traffic (employee and delivery vehicles, queuing trucks near gates), other off-road equipment, (e.g., forklifts, reach stackers, and refrigeration units), and truck routes and rail segments beyond those modeled within the yard. We did not include these, which likely understates changes in local pollution. We do not model construction-related emissions either, although there is ongoing construction activity on the south side of the 47th Street Yard and there is a chance that this will continue to be the case post-merger.

Electrification and electricity demand. Electrifying yard equipment removes tailpipe emissions at the yard but shifts some emissions to power plants. Our CO_2 and social cost of carbon estimates (Appendix F) do not include CO_2 from the added electricity demand, which depends on the regional grid mix, so we likely overstate the net climate benefit of electrification. Electricity-related emissions of NO_x and $PM_{2.5}$ from power plants are also excluded from our emissions accounting.

Health estimates. The results in our health analysis are the expected annual health impacts of exposure to primary pollutants emitted by the modeled sources, and not total pollution-related health burdens in these tracts, neglecting the cumulative impacts of other rail emissions and environmental stressors in and near Englewood. The ranges reflect only the confidence intervals of the relative risk (RR) values and not uncertainty from the modeled concentrations, emissions, baseline incidence, or population. $PM_{2.5}$ and NO_2 mortality estimates are reported separately and should not be summed, because they may partly reflect the same underlying exposure[62]. Because the two tracts have small populations and census data includes random noise that is especially present in small populations, the estimated number of cases are low and are better read as relative differences among scenarios than as predicted counts of individual events. There are also employees working at 47th Street who likely face similar, if not more concentrated, pollutant exposure than neighborhood residents, which is not included in our health analyses, but is an important occupational hazard to bear in mind.

We also assume that exposure comes from general traffic-related-air-pollutant $PM_{2.5}$ composition, whereas emissions from locomotives do not have the same speciation as from general diesel[63], and which may potentially alter health implications of locomotive emissions. NO_2/NO_x ratios are highly variable, and so our health analyses should be considered with the uncertainty bounds we display in Appendix E. This range comes from uncertainty in meteorology, atmospheric chemistry, seasonality, and short-term variability that cannot be characterized in an annualized AERMOD analysis. We urge UPNS to conduct an in-depth air quality analysis with a chemical transport model that incorporates this variability and resolves its associated uncertainty.

Short-term variability and edge cases. We do not include short-term exposure, extreme events, or seasonality in our analyses. We also do not include the likely increase in activity, congestion, dwell times, etc., that may occur at or near the 47th Street Yard during the initial adjustment period to the merger, as there are logistical stressors with all administrative and infrastructural changes. As with the prior point, high-resolution chemical transport models capture seasonality and resolve many of the uncertainties that are inherent to AERMOD and other annualized models that do not include secondary chemistry.

Post-merger growth assumptions. The assumptions about post-merger growth underlying this analysis are much lower than Applicants' estimates. The 5-year post-merger yard activity change assumption we used for the 47th Street Yard, 20% growth total, is much lower than the 30% growth in lifts Applicants reported under the Growth Plan and growth corresponding to the increase in truck trips reported to the Office of Environmental Analysis in this proceeding. Additionally, the Durango-Cohen traffic analysis, described in its memorandum "Re: STB Docket No. 36873: Traffic Near Englewood After the UP-NS Merger," dated

November 18, 2026, yielded a 2% truck-to-train diversion for growth on rail segments while Applicants estimated more growth at 13%.

Appendix A: Baseline Concentrations

The Appendix A ambient baseline represents a Jan/Jul mean (2019 inputs), while the AERMOD increments are annual averages (2024 meteorology). So, we cannot assume that these concentrations are compatible, but as a rough estimate, baseline emissions from the yard constitute ~5% of the NO_2 concentrations, averaging the overlapping nodes of the AERMOD receptor network with the grid cell, and ~0.4% of $PM_{2.5}$ concentrations. However, AERMOD receptor values vary greatly, with some AERMOD node NO_2 values exceeding the concentration in the gridded product cell.

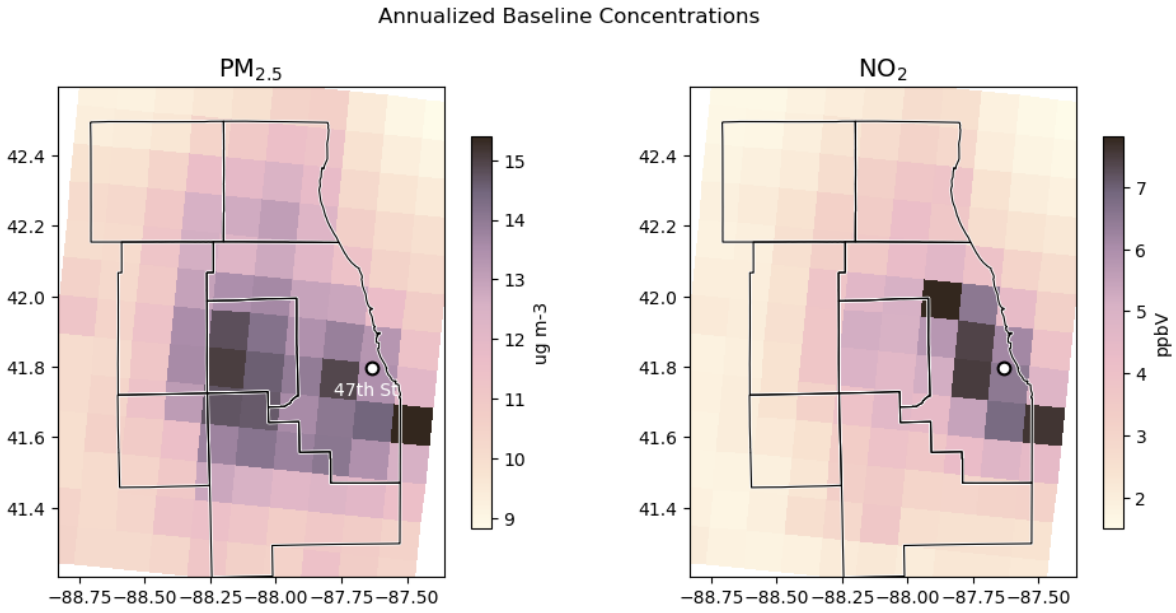

Figure A1. Averaged concentrations of particulate matter ($PM_{2.5}$) and nitrogen dioxide (NO_2) over the Chicago Metropolitan Agency for Planning (CMAP) jurisdiction, derived using the coupled Weather Research and Forecasting-Community Scale Air Quality (WRF-CMAQ) model[51], highlighting the location of the 47th Street Rail Yard.

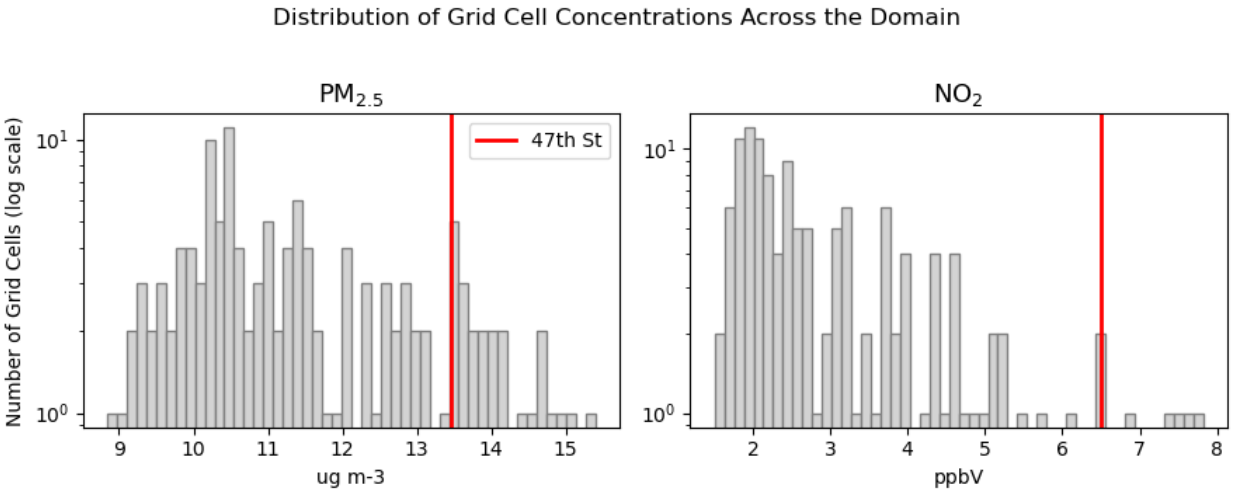

Figure A2. Baseline concentrations of $PM_{2.5}$ and NO_2 within the 12km grid cell containing the 47th Street Rail Yard, relative to the concentrations modeled in all other cells over the CMAP jurisdiction.

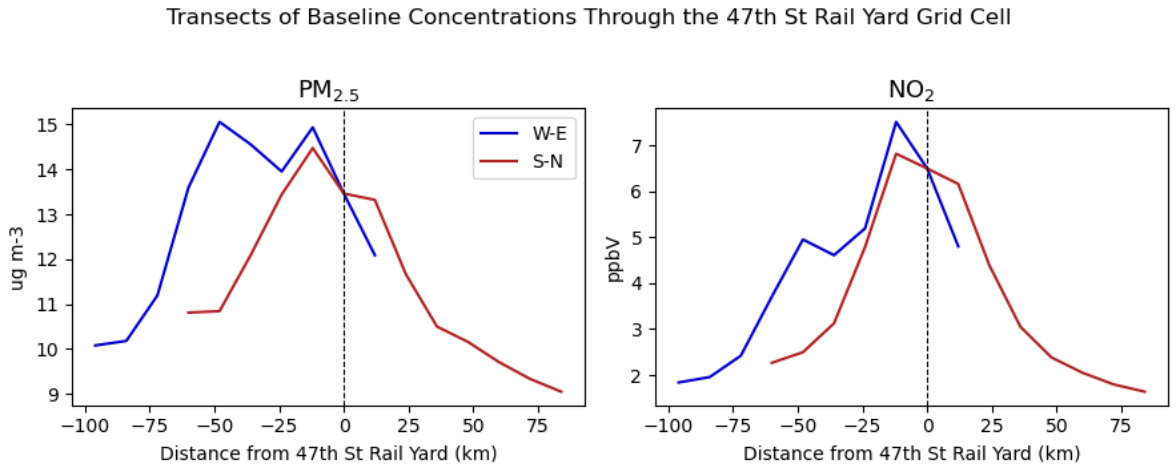

Figure A3. Transects of baseline $PM_{2.5}$ and NO_2 concentrations relative to the 47th Street UPNS railyard.

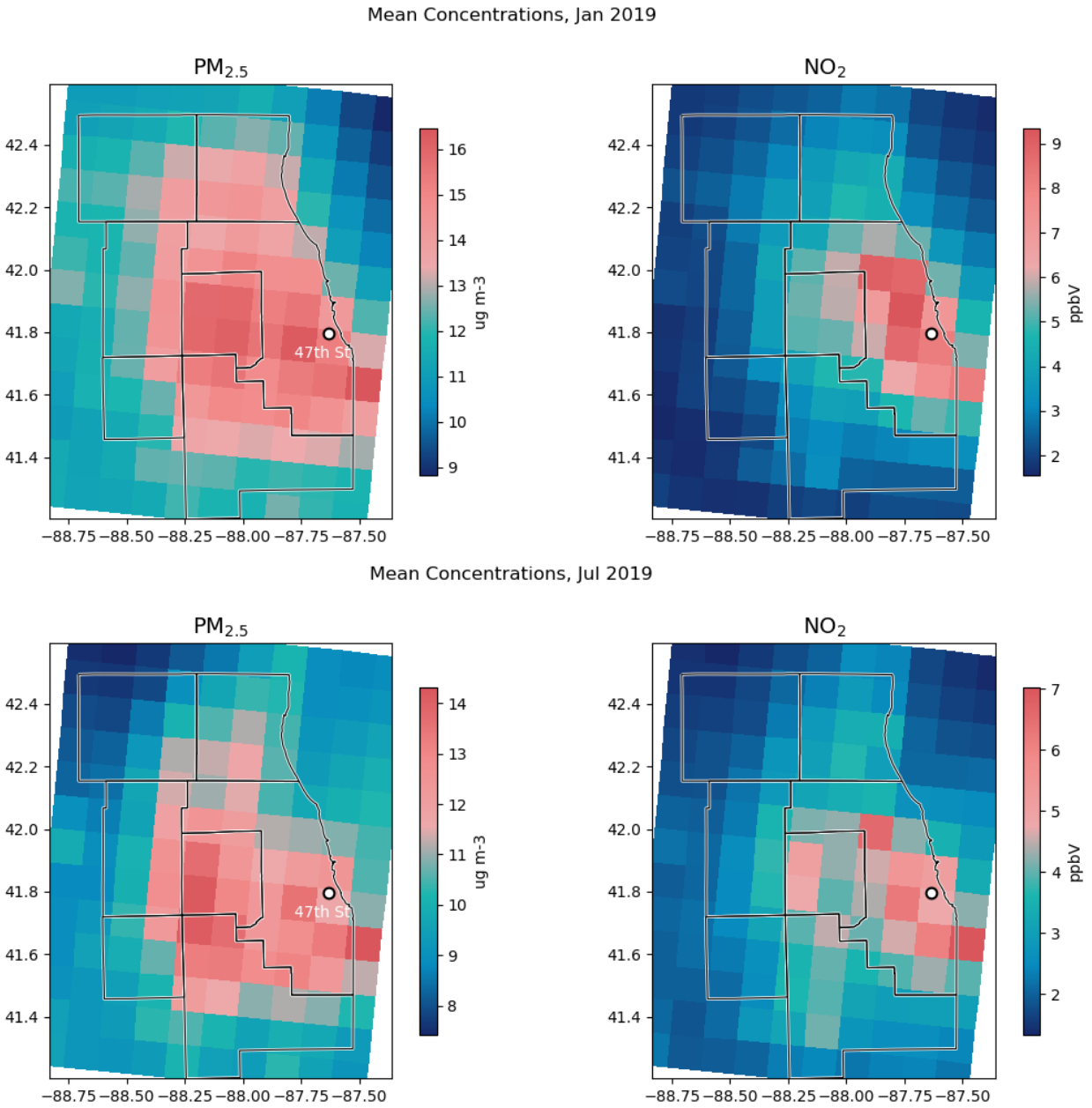

Figure A4. Baseline concentrations of $PM_{2.5}$ and NO_2 over the CMAP domain by season. Winter (January) and Summer (June) show spatial heterogeneity between seasons, signaling the potential shortcomings of annualized models, which are not designed for seasonal and extreme-event analyses.

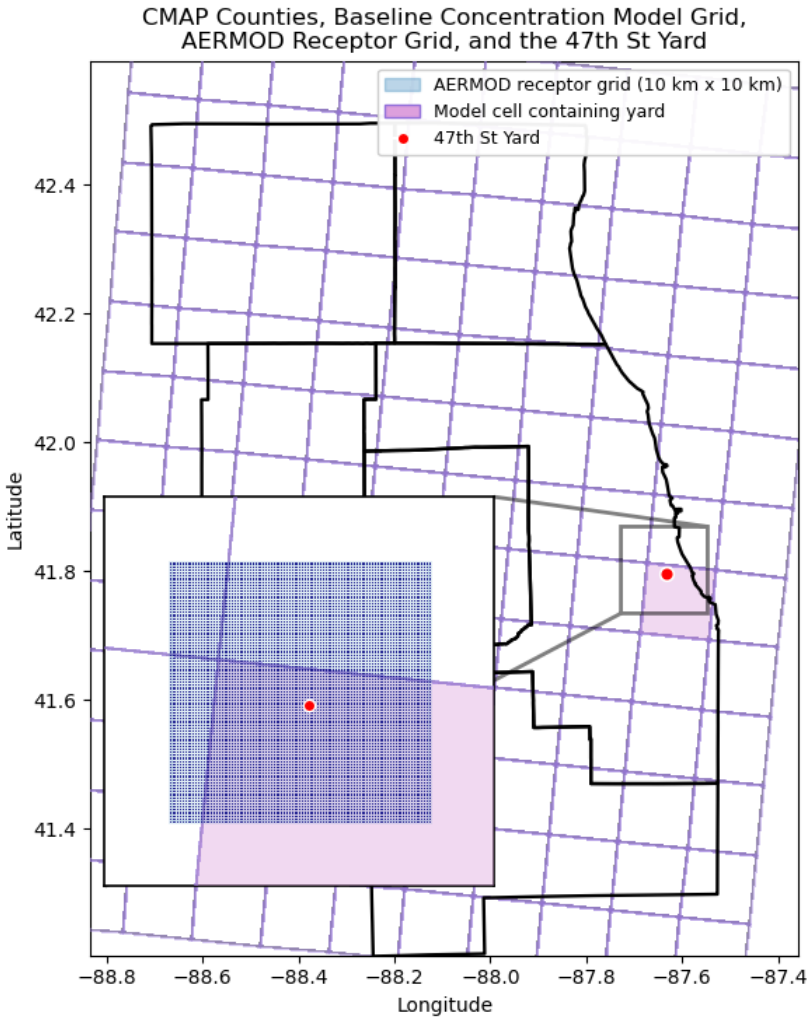

Figure A5. A nested map of the baseline concentration 12 km WRF-CMAQ model grid[51], highlighting the cell containing the 47th Street Yard, and comparing the baseline concentration model scale to our 10km^2 AERMOD receptor grid.

Appendix B: Preprocessing Models

Variable	Mean	SD	Median
Wind Speed (m/s)	4.66	2.31	4.36
Wind Direction (degrees)	184.05	104.08	200.00
Temperature (°C)	15.42	38.69	14.95
Relative Humidity (%)	63.84	51.91	62.00
Pressure (hPa)	993.50	7.24	994.00
Cloud Cover (tenths)	6.49	5.93	7.00
Convective Mixing Height (m)	-215.11	1,026.70	-
Mechanical Mixing Height (m)	462.97	502.48	448.00
Friction Velocity (m/s)	-0.13	2.07	0.32
Convective Velocity (m/s)	-4.87	5.03	-9.00
Sensible Heat Flux (W/m²)	-6.27	215.47	-7.20
Surface Roughness Length (m)	0.04	0.01	0.05
Bowen Ratio	1.00	0.29	1.13
Albedo	0.65	0.36	0.83

Table B1: Summary statistics of annualized surface meteorology and characteristics from AERMET, using 2024 surface meteorological data from Midway International Airport (KMDW) and upper-air sounding from Davenport, IA (KDVN). This is the baseline meteorology input for AERMOD analyses.

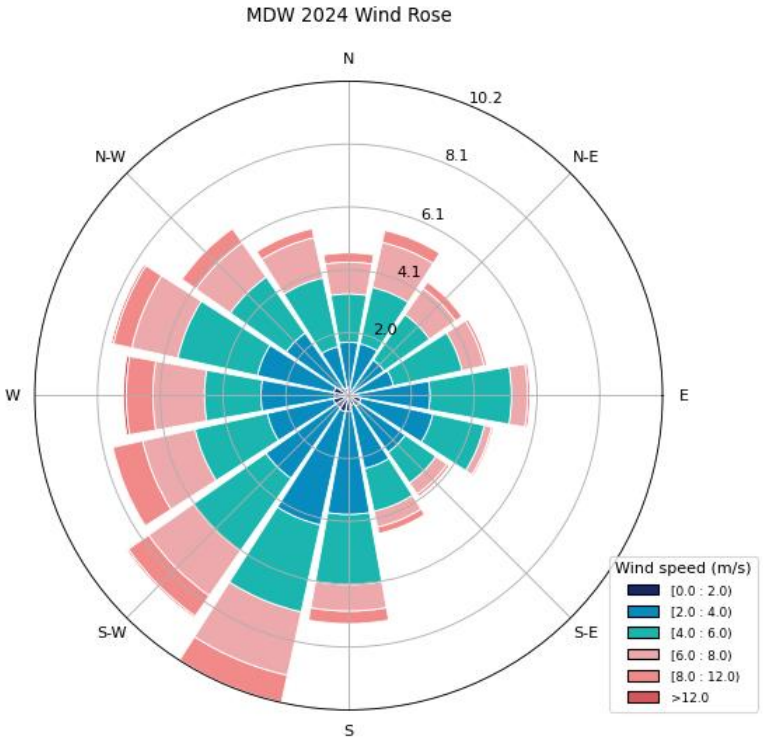

Figure B1. Annualized wind rose for 2024 meteorology at Midway International Airport (KMDW).

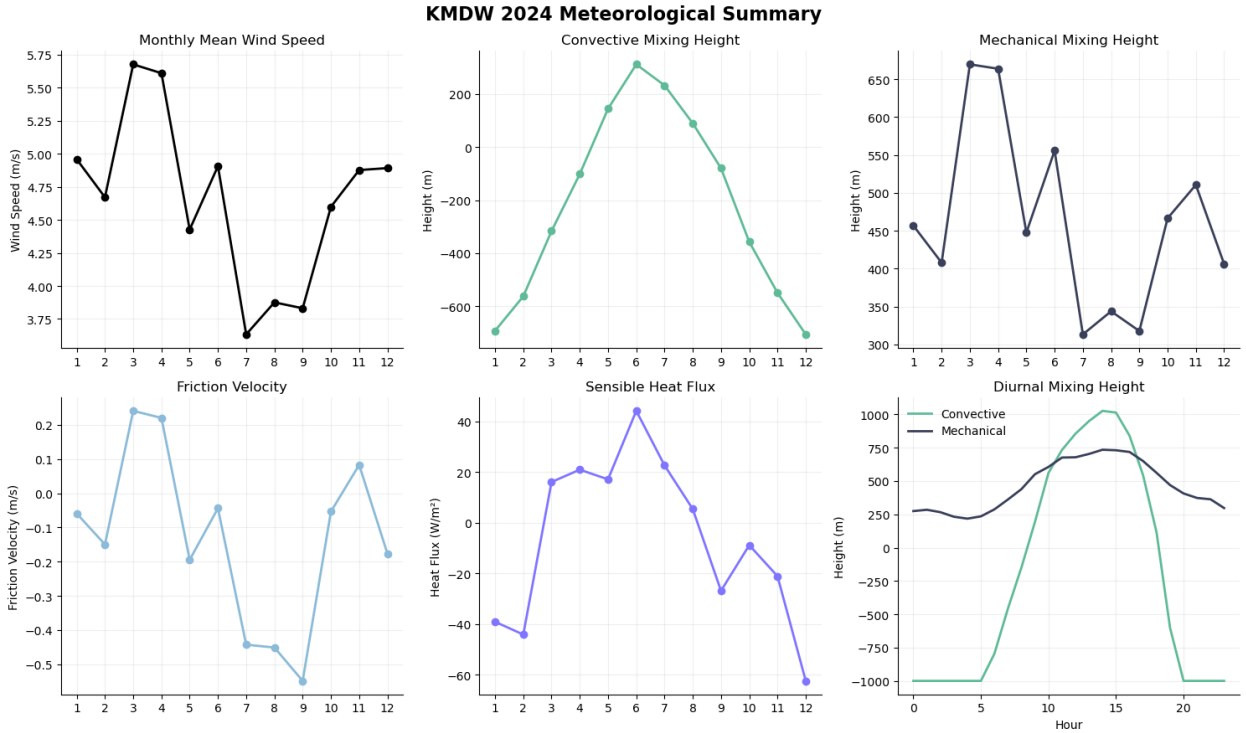

Figure B2. A summary of meteorological conditions at KMDW for 2024.

Appendix C: Source Characterization

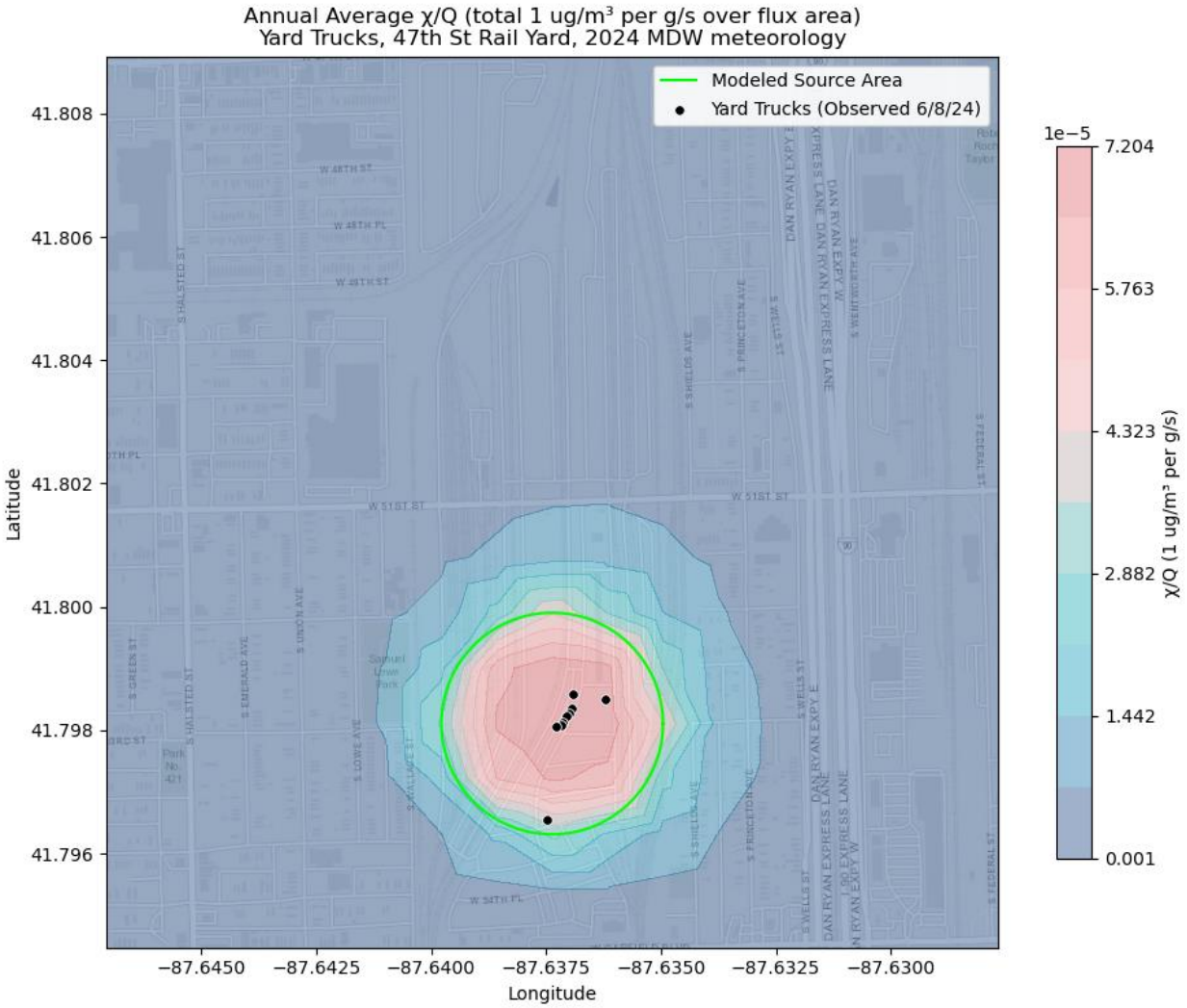

Figure C1. Justification for the spatial distribution of yard truck emissions in our analysis. Using Google Earth, we observed trucks at the shown locations (black dots) in an image taken on June 8, 2024. Images taken on other days found similar spatial distributions of these vehicles. These vehicles likely travel elsewhere in the yard, but we find that the majority of the satellite imagery finds them within the green domain.

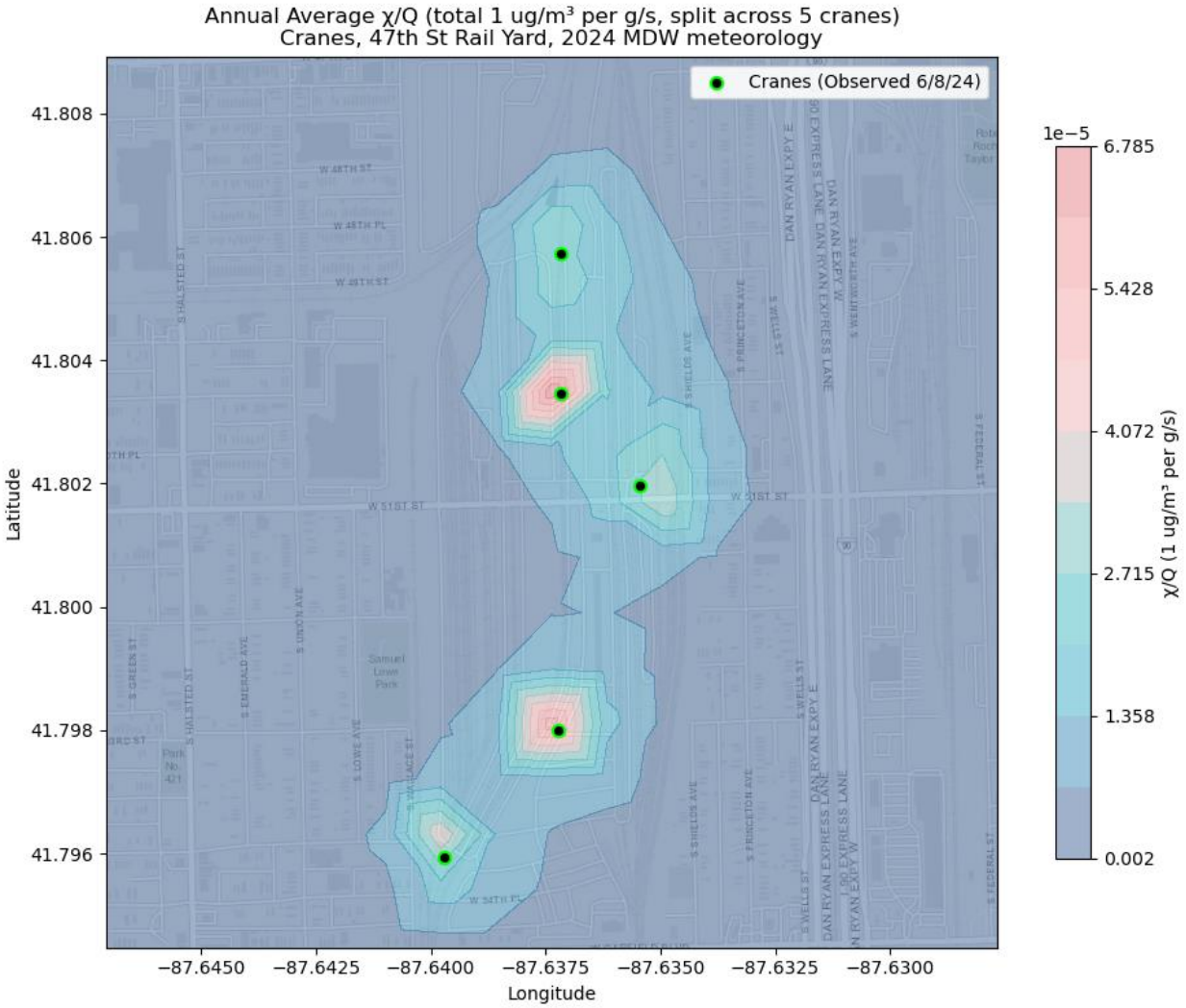

Figure C2. Justification for the spatial distribution of crane emissions in our analysis. Using Google Earth, we observed cranes at the shown locations (black dots with green outlines) in an image taken on June 8, 2024. These represent stationary gantry cranes. There are also mobile cranes at the site, but we distribute crane emissions between known crane locations.

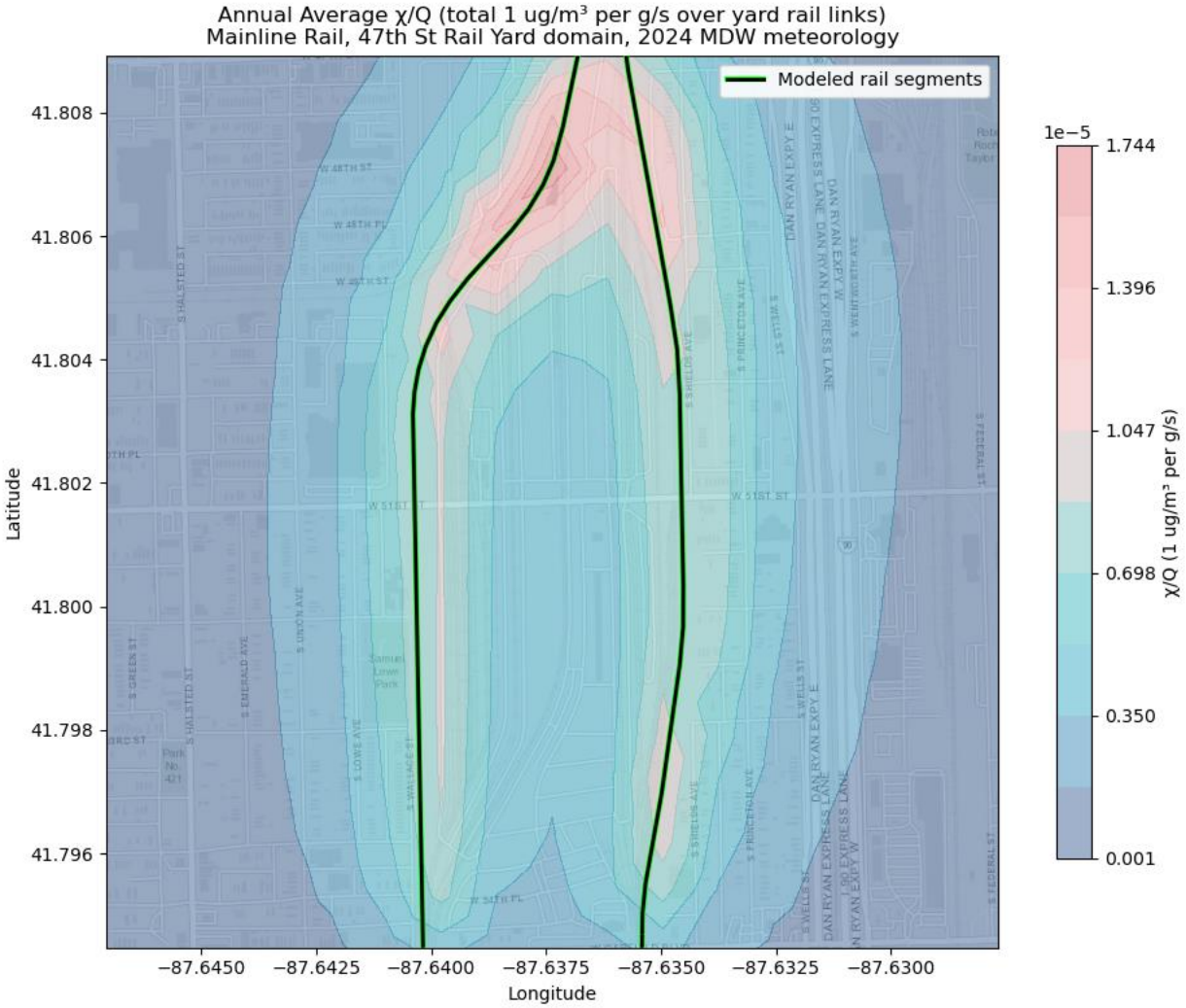

Figure C3. Justification for the spatial distribution of mainline rail emissions in our analysis. Here, we use rail links within the yard perimeter (black lines with green outlines), with activity and resulting emissions densities derived from the Durango-Cohen Group.

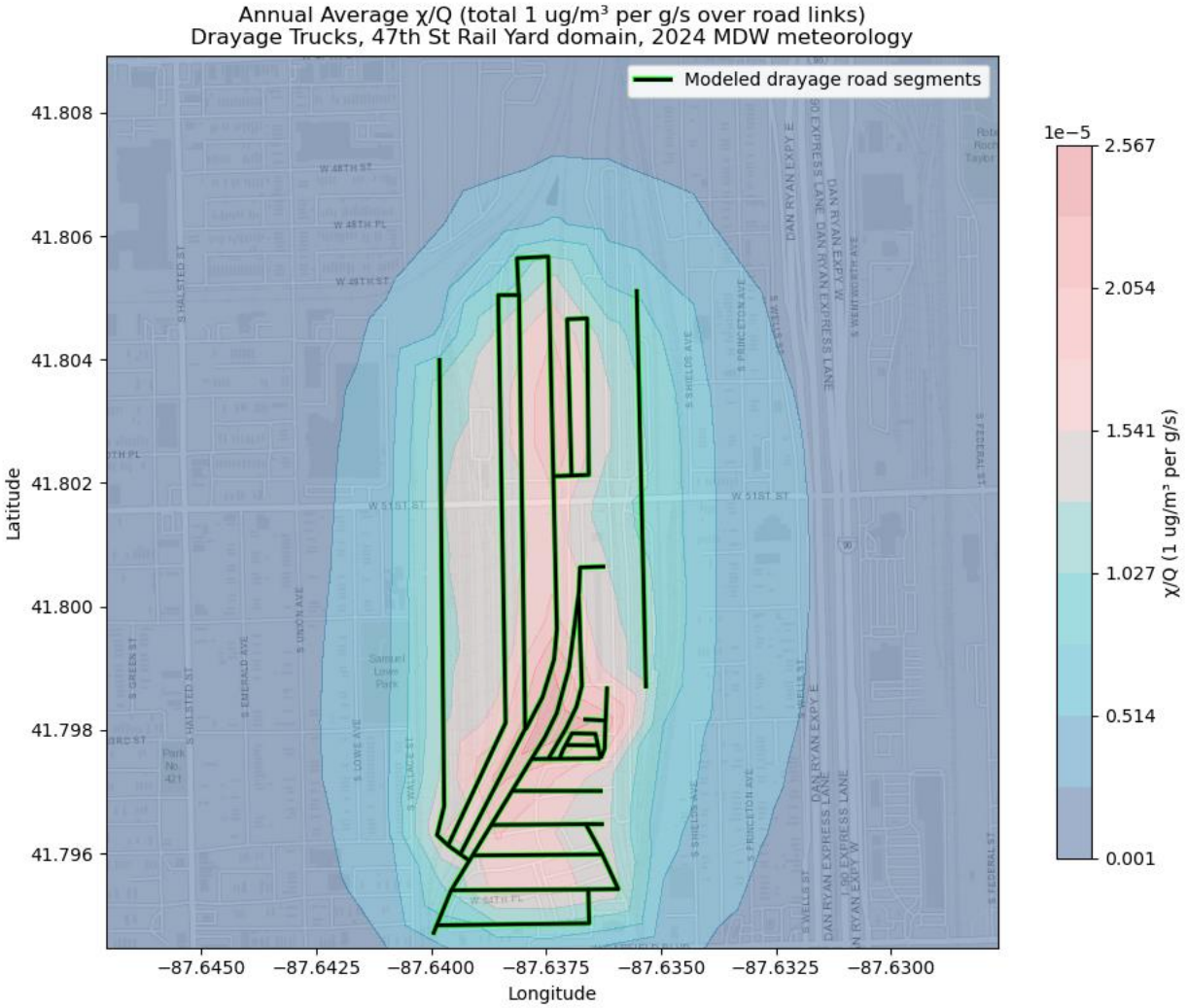

Figure C4. Justification for the spatial distribution of in-yard drayage emissions in our analysis. Using Google Earth, we observed roads at the shown locations (black lines with green outlines) in an image taken on June 8, 2024. These represent annualized drayage truck locations, although they may not capture the true path these vehicles follow.

Appendix D: AERMOD Results

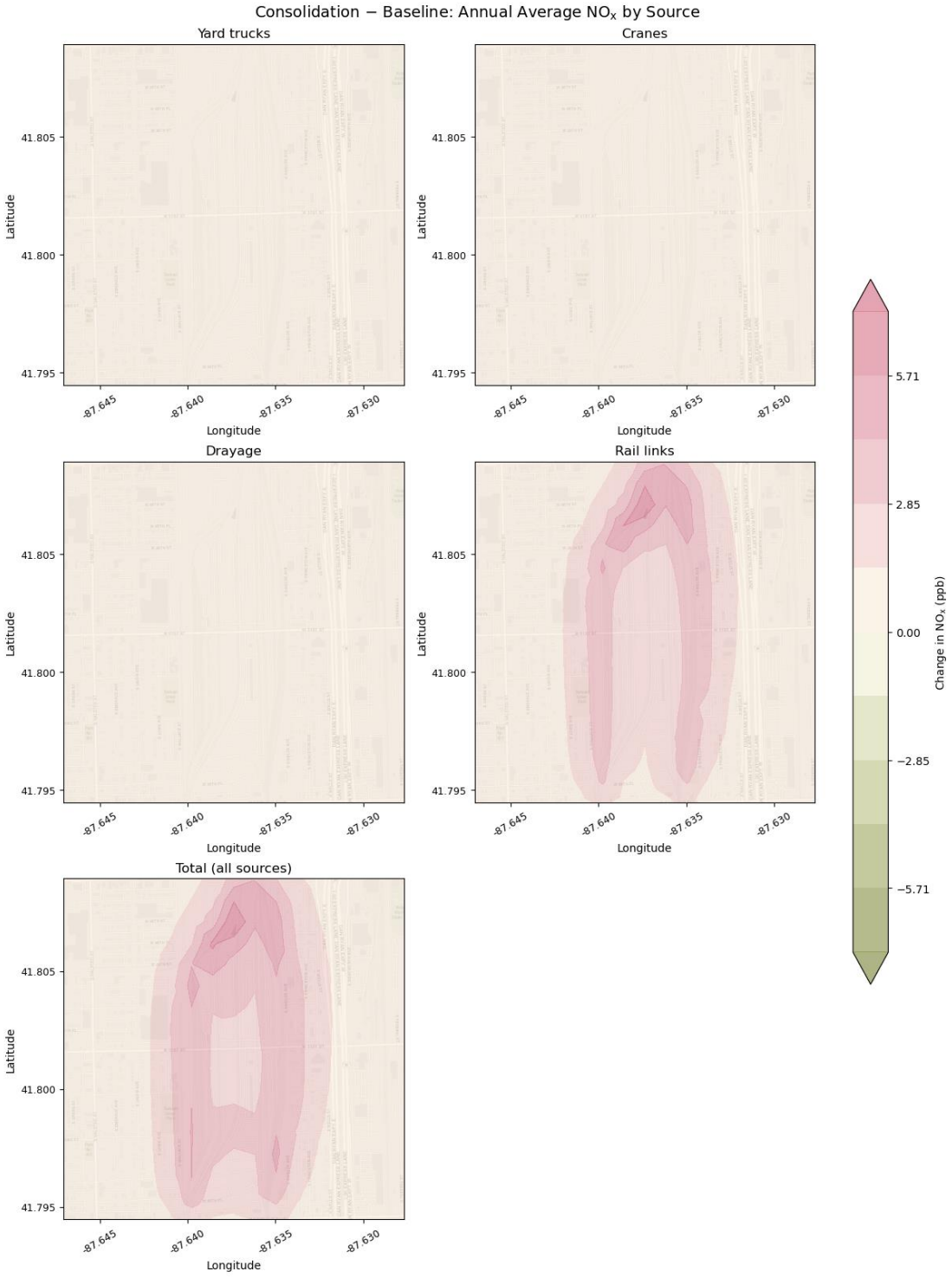

Figure D1. Difference between baseline and consolidation 47th Street Yard attributed NO_x concentrations, by source, and aggregated.

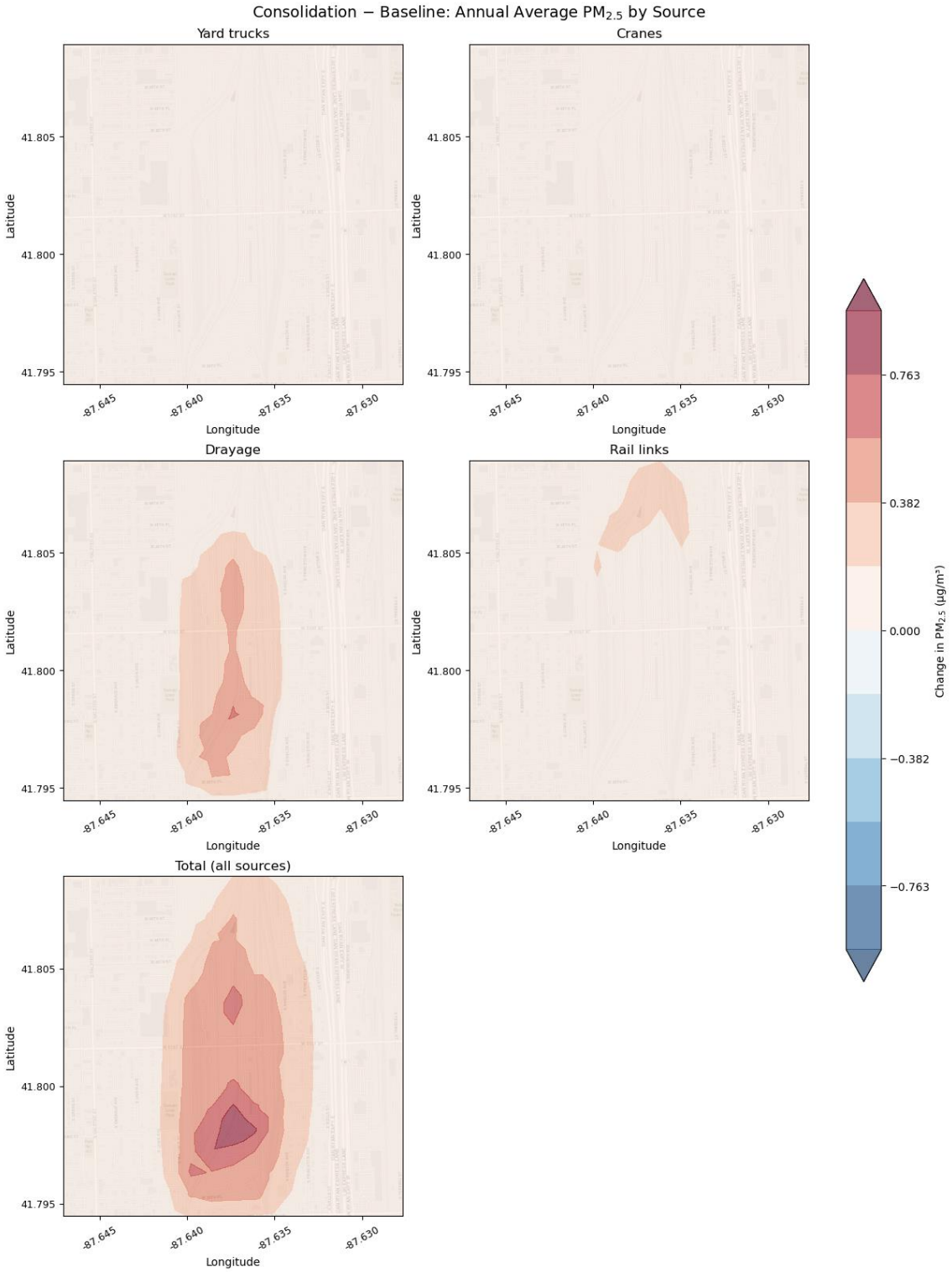

Figure D2. Difference between baseline and consolidation 47th Street Yard attributed $PM_{2.5}$ concentrations, by source, and aggregated.

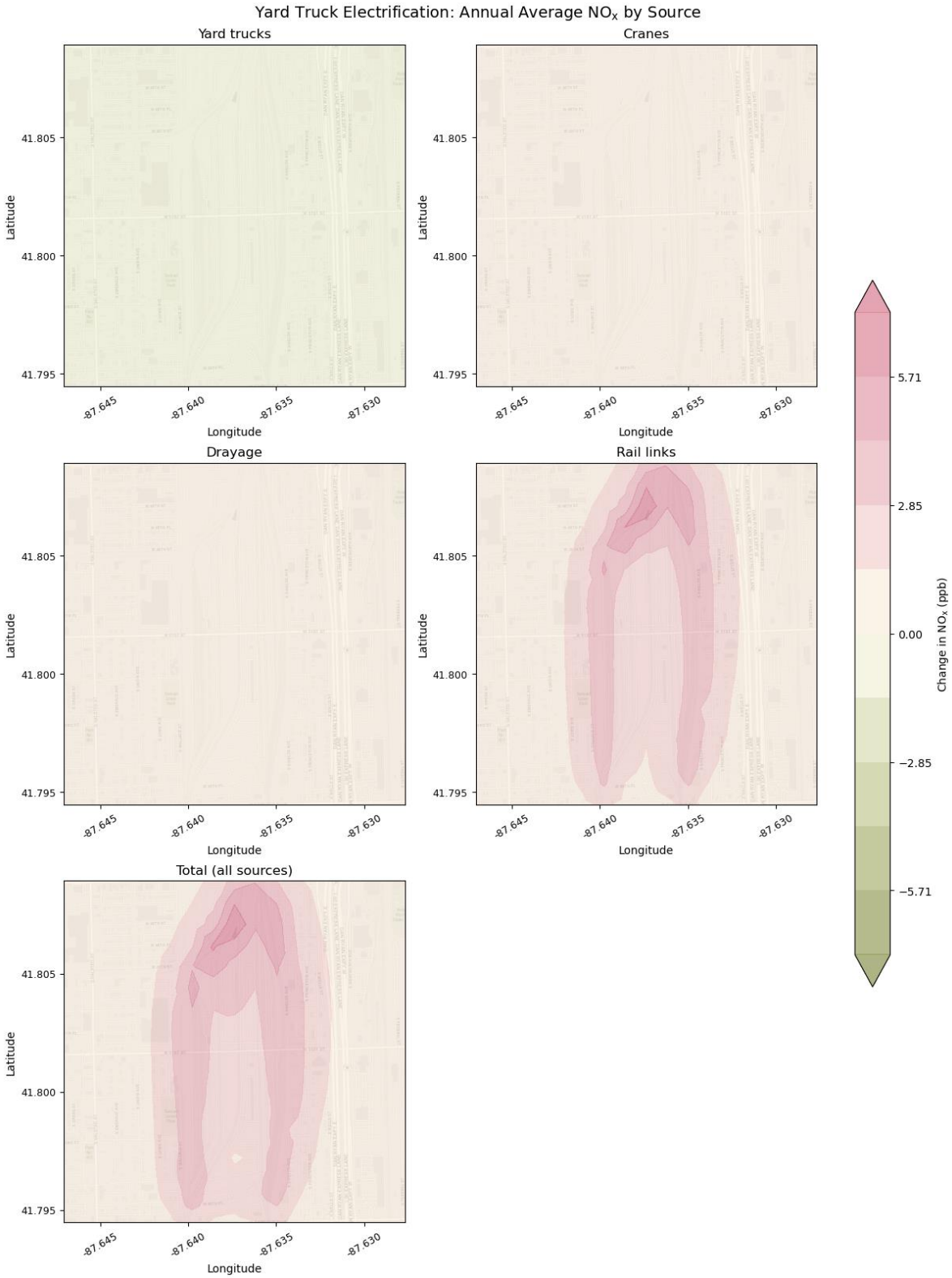

Figure D3. Difference between baseline and consolidation-electrification scenario 47th Street Yard attributed NO_x concentrations, by source, and aggregated.

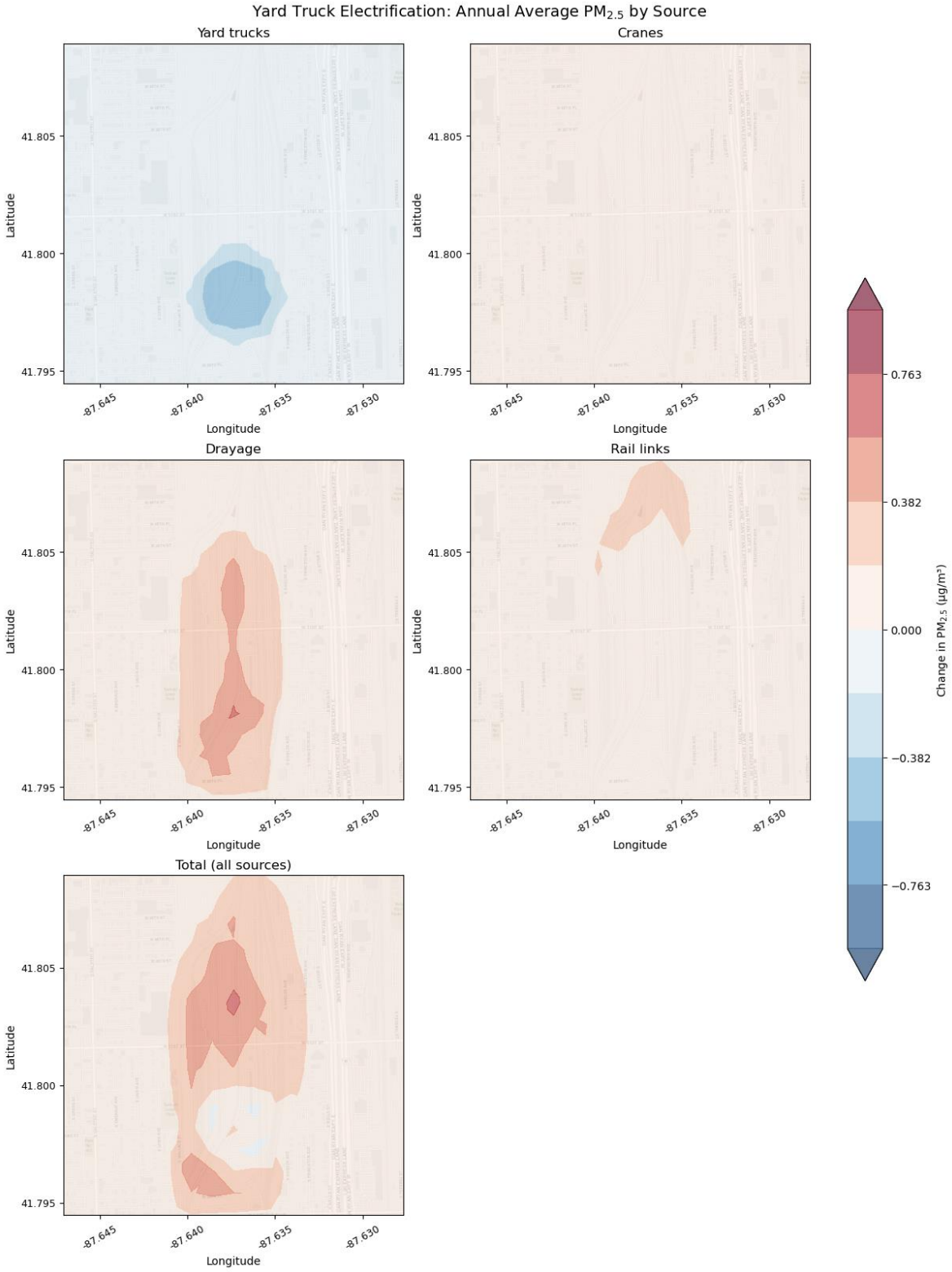

Figure D4. Difference between baseline and consolidation-electrification scenario 47th Street Yard attributed $PM_{2.5}$ concentrations, by source, and aggregated.

Appendix E: Health Analyses

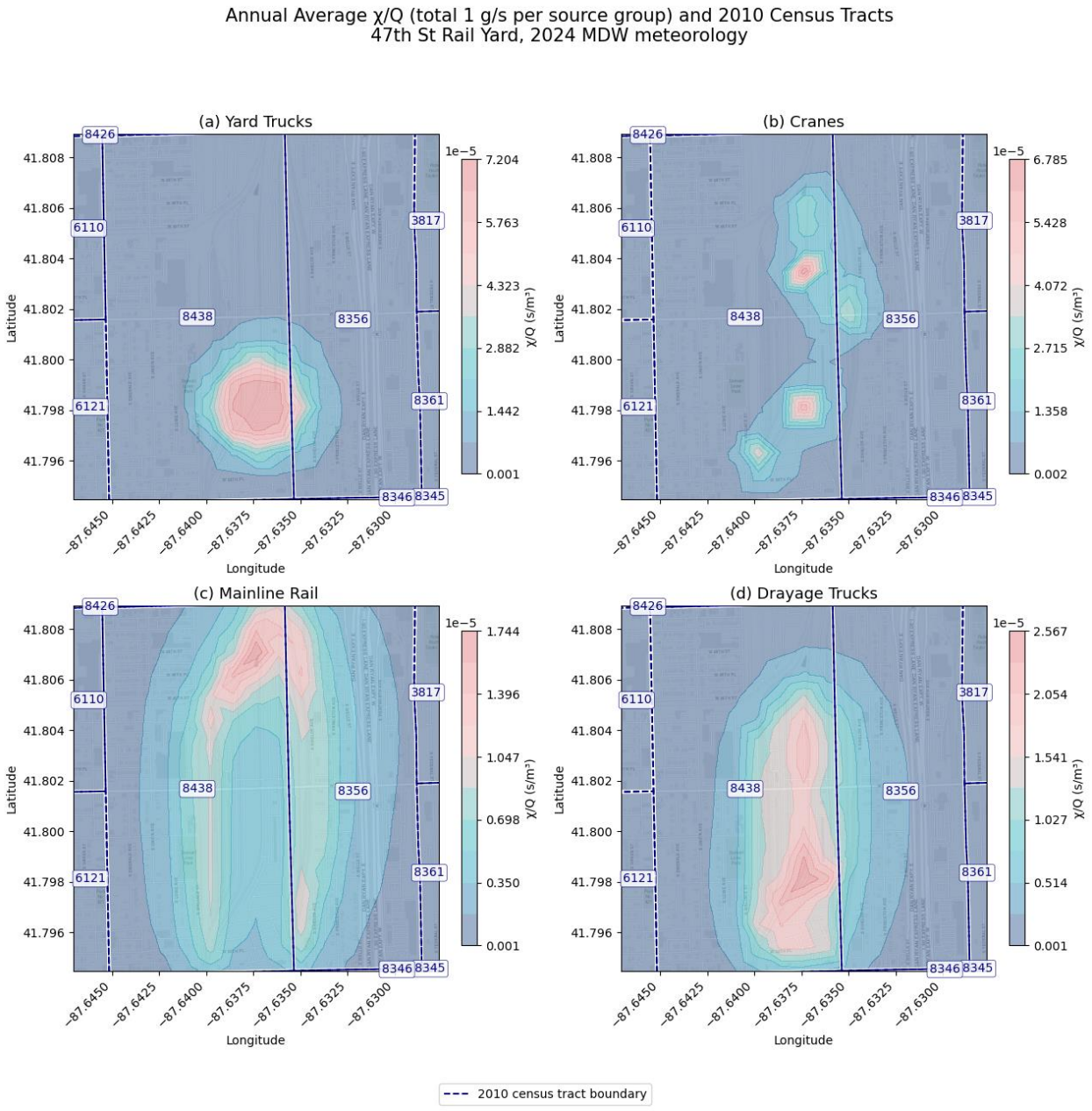

Figure E1. χ/Q fields for the four yard emissions sources of interest (yard trucks, cranes, mainline rail, and drayage trucks) within a 1mi^2 domain, compared with 2010 census tracts. Because the majority of the χ/Q fields lie within two census tracts (8356 and 8438), we use these for our hyper-local health analyses.

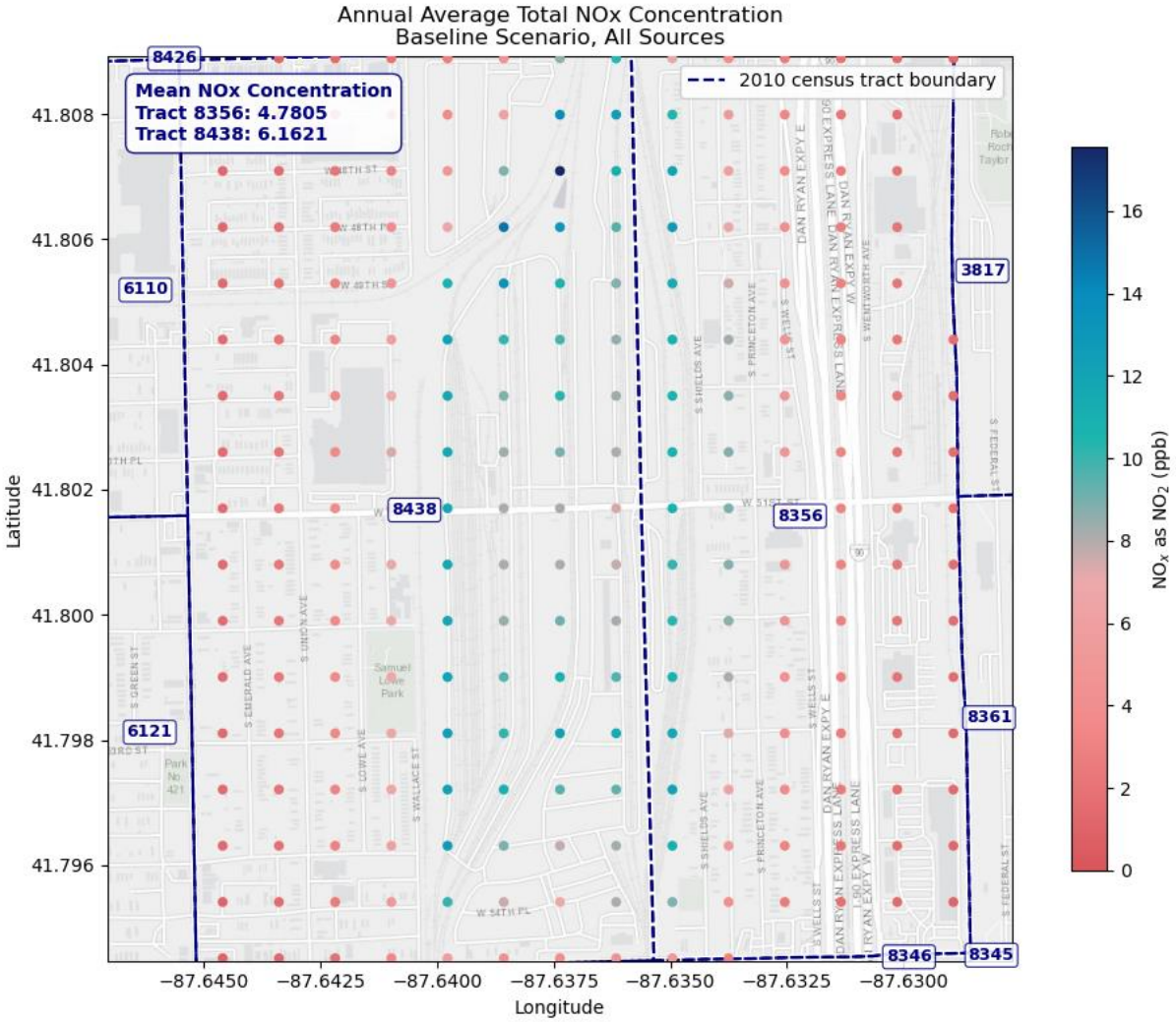

Figure E2. NO_x concentrations from the baseline AERMOD scenario, clipped to the two census tracts of interest (8356 and 8438), with the average concentrations for each tract.

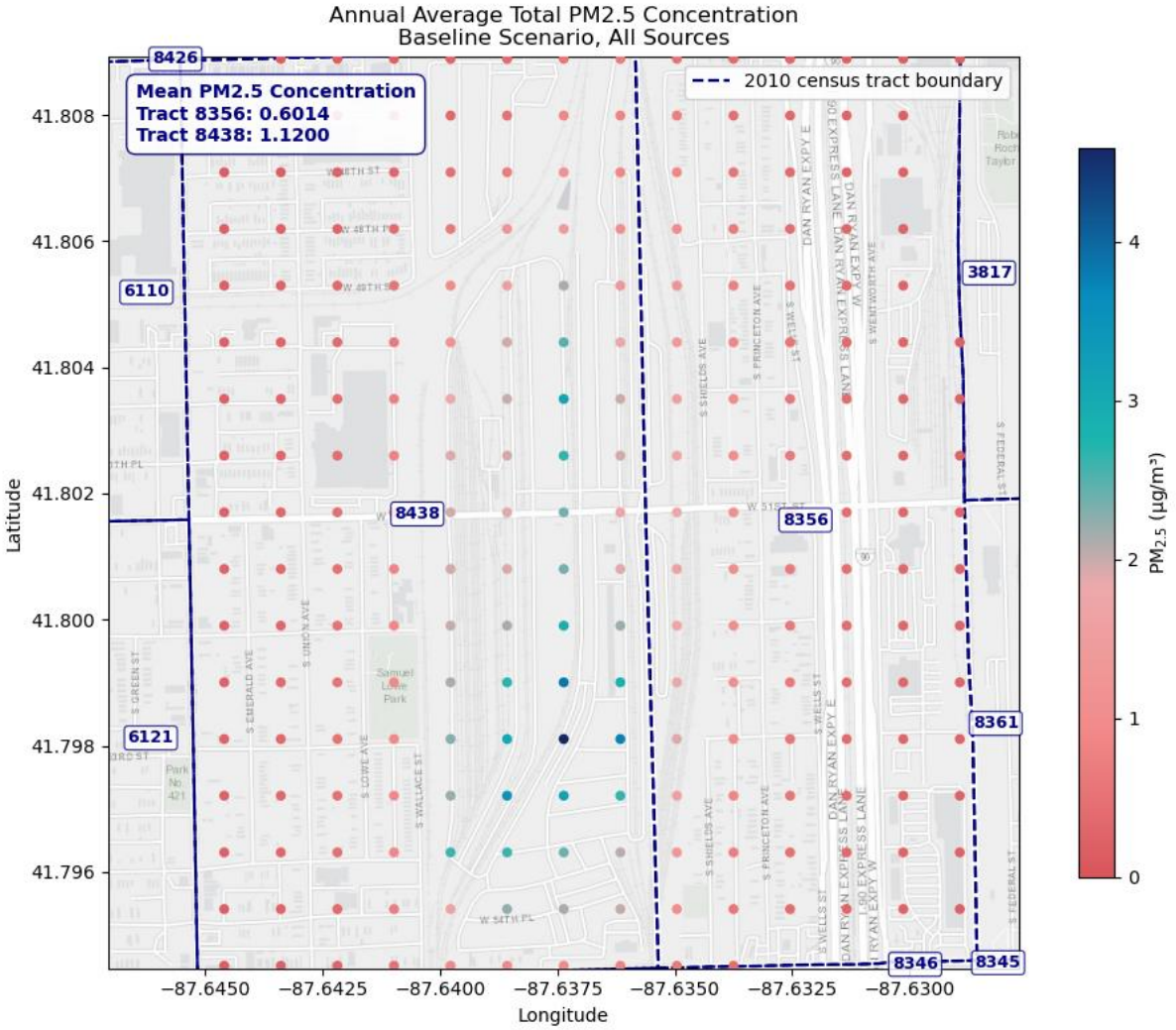

Figure E3. $PM_{2.5}$ concentrations from the baseline AERMOD scenario, clipped to the two census tracts of interest (8356 and 8438), with the average concentrations for each tract.

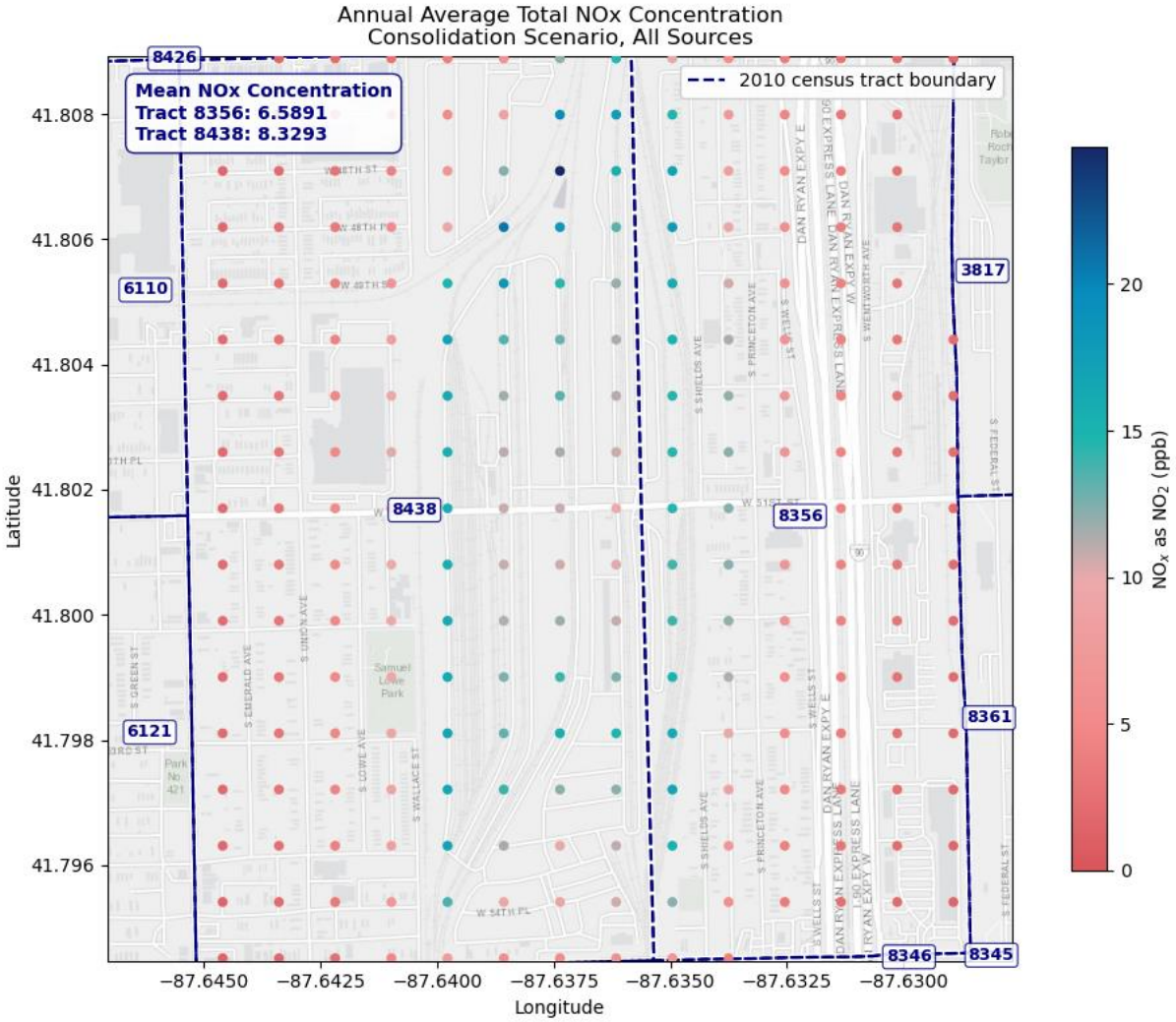

Figure E4. NO_x concentrations from the consolidation AERMOD scenario, clipped to the two census tracts of interest (8356 and 8438), with the average concentrations for each tract.

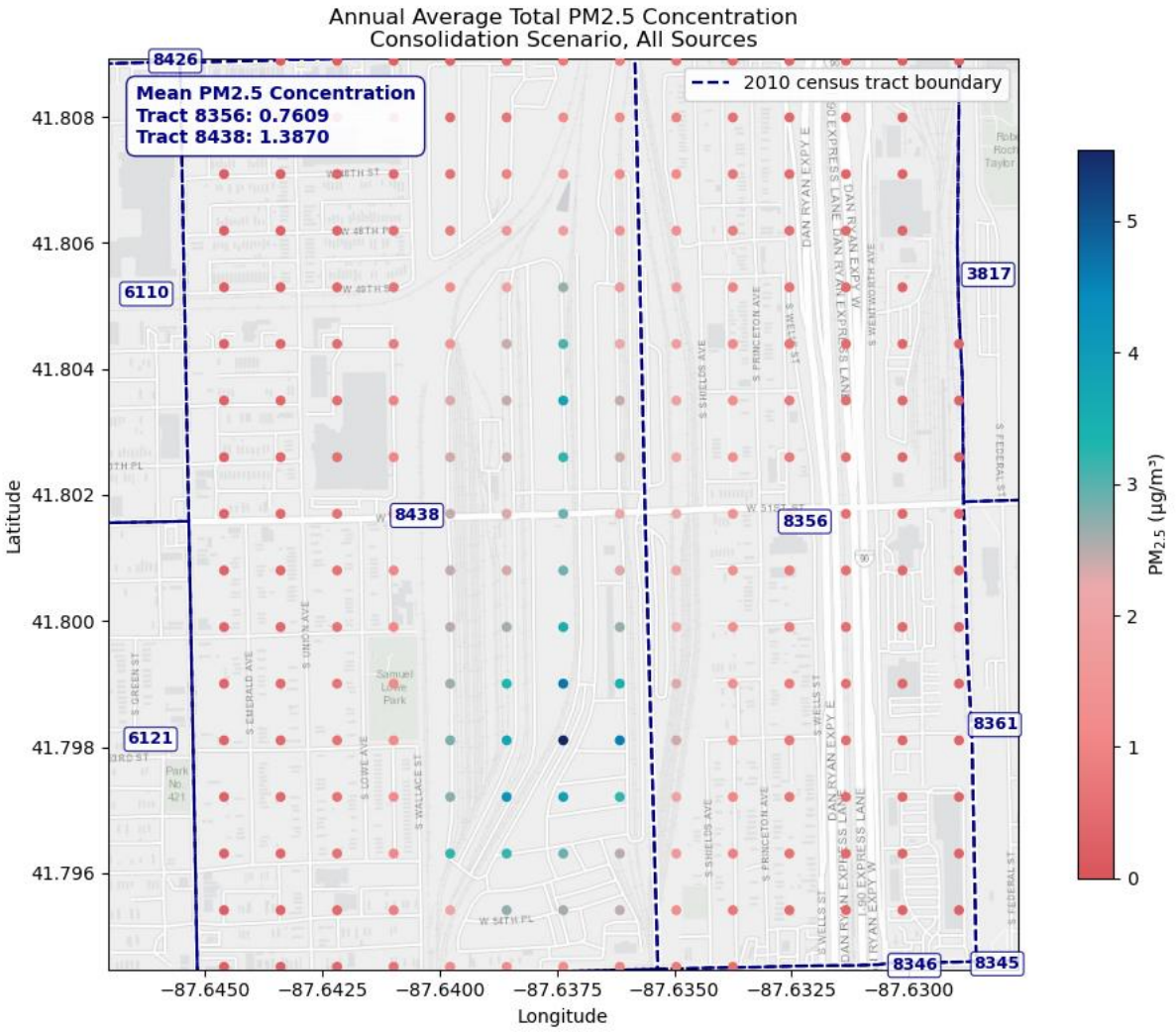

Figure E5. $PM_{2.5}$ concentrations from the consolidation AERMOD scenario, clipped to the two census tracts of interest (8356 and 8438), with the average concentrations for each tract.

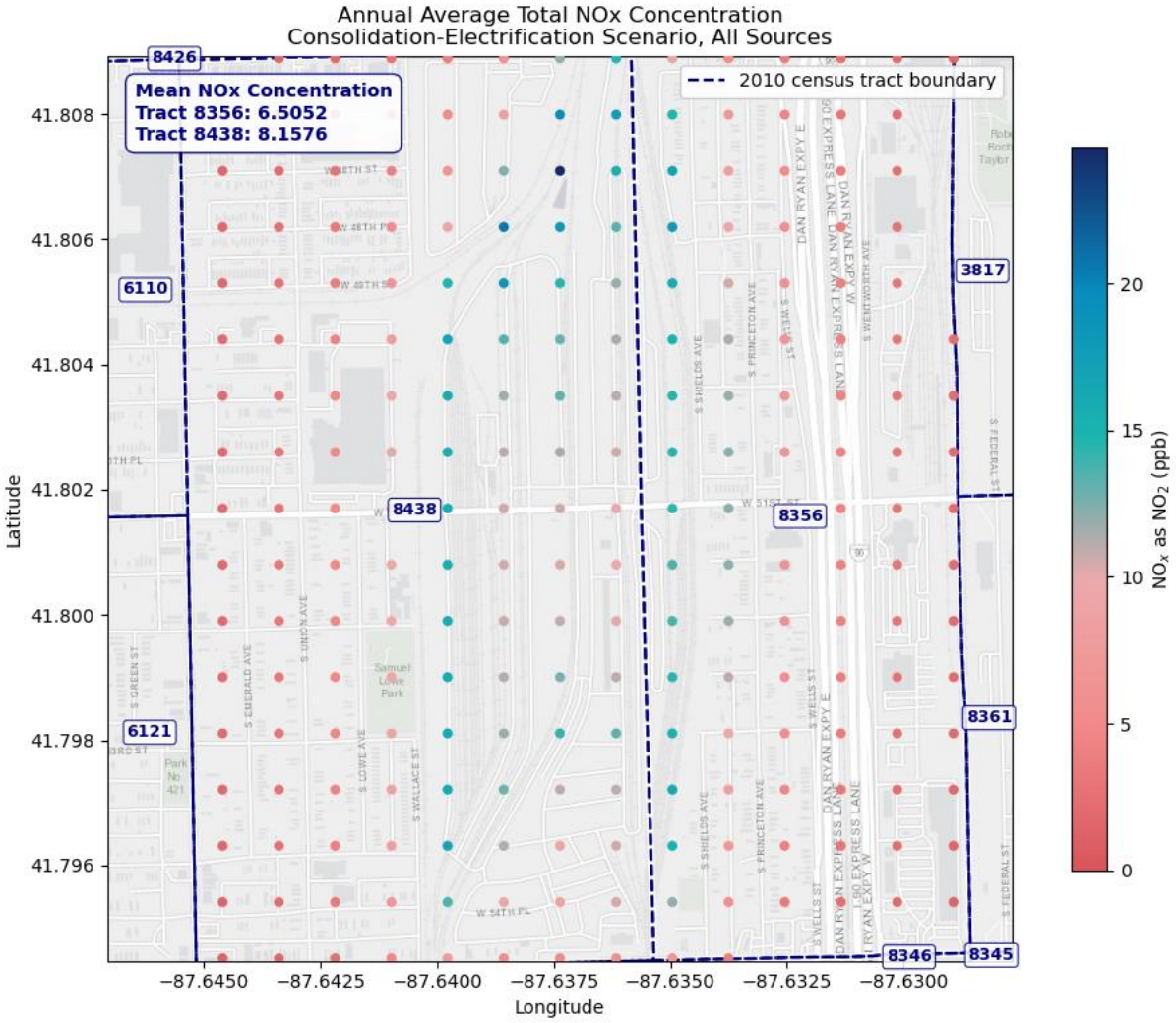

Figure E6. NO_x concentrations from the consolidation-electrification AERMOD scenario, clipped to the two census tracts of interest (8356 and 8438), with the average concentrations for each tract.

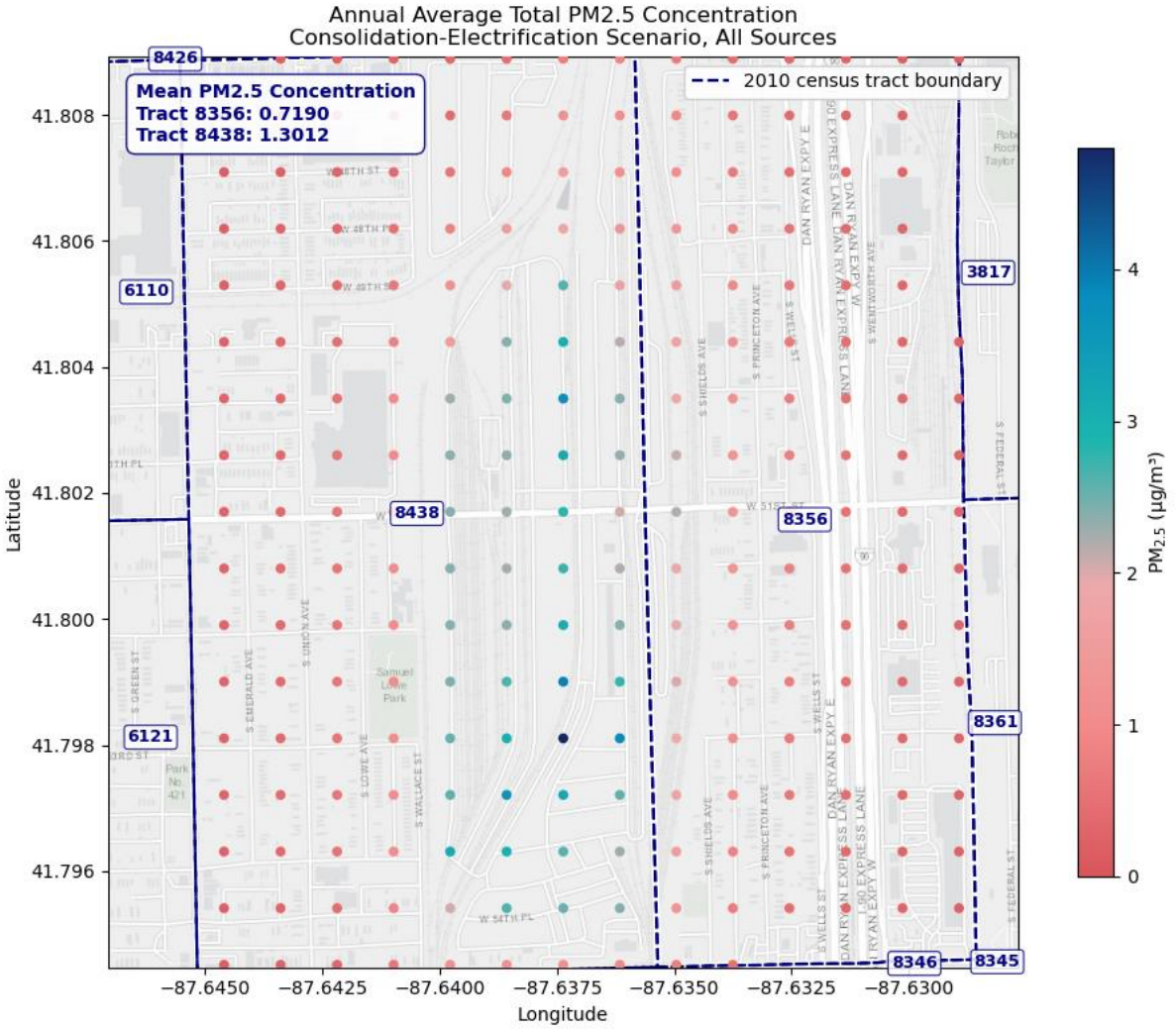

Figure E7. $PM_{2.5}$ concentrations from the consolidation-electrification AERMOD scenario, clipped to the two census tracts of interest (8356 and 8438), with the average concentrations for each tract.

Table E1. Health burden incidence from $PM_{2.5}$ and NO_2 emitted at the 47th Street Yard in the two closest census tracts, with 95% confidence bounds.

Scenario / comparison	Mortality (30+), NO_2	Mortality (30+), $PM_{2.5}$	Adult asthma, NO_2	Child asthma, NO_2
Baseline burden (vs. no yard)	1.06 (0.273 to 1.57)	0.178 (0.06 to 0.236)	0.476 (0.0515 to 0.915)	0.176 (−0.0372 to 0.398)
Consolidated burden	1.44 (0.371 to 2.12)	0.221 (0.0747 to 0.294)	0.638 (0.07 to 1.21)	0.238 (−0.0507 to 0.533)
Consolidated + electrification burden	1.41 (0.365 to 2.08)	0.208 (0.0703 to 0.276)	0.628 (0.0687 to 1.19)	0.234 (−0.0498 to 0.525)
Consolidated vs. baseline	0.388 (0.0989 to 0.575)	0.0438 (0.0148 to 0.0581)	0.176 (0.0186 to 0.347)	0.0646 (−0.0134 to 0.149)
Electrification vs. baseline	0.362 (0.0923 to 0.537)	0.0305 (0.0103 to 0.0405)	0.164 (0.0174 to 0.324)	0.0603 (−0.0125 to 0.139)
Electrification vs. consolidated	−0.0262 (−0.039 to −0.00665)	−0.0133 (−0.0177 to −0.00449)	−0.0121 (−0.0242 to −0.00126)	−0.00429 (−0.00997 to 0.000883)

Table E2. Census populations and the baseline risk in each census tract (incidence)[58,59].

Tract	Population 30+	Baseline mortality risk, 30+ (per 100,000 per year)	Children (<18) population	Baseline child asthma incidence (per 100,000 per year)	Adults (18+) population	Baseline adult asthma incidence (per 100,000 per year)
8356	607	2,255	150	1,346	746	336
8438	961	2,039	341	724	1,179	318

Table E3. Census age distributions[59].

Tract	Age Bin	Count
8356	05-14	82
8356	15-24	71
8356	25-34	163
8356	35-44	91
8356	45-54	55
8356	55-64	83
8356	65-74	214
8356	75-84	76

8356	85-99	12
8438	05-14	184
8438	15-24	192
8438	25-34	215
8438	35-44	301
8438	45-54	146
8438	55-64	190
8438	65-74	214
8438	75-84	50
8438	85-99	0

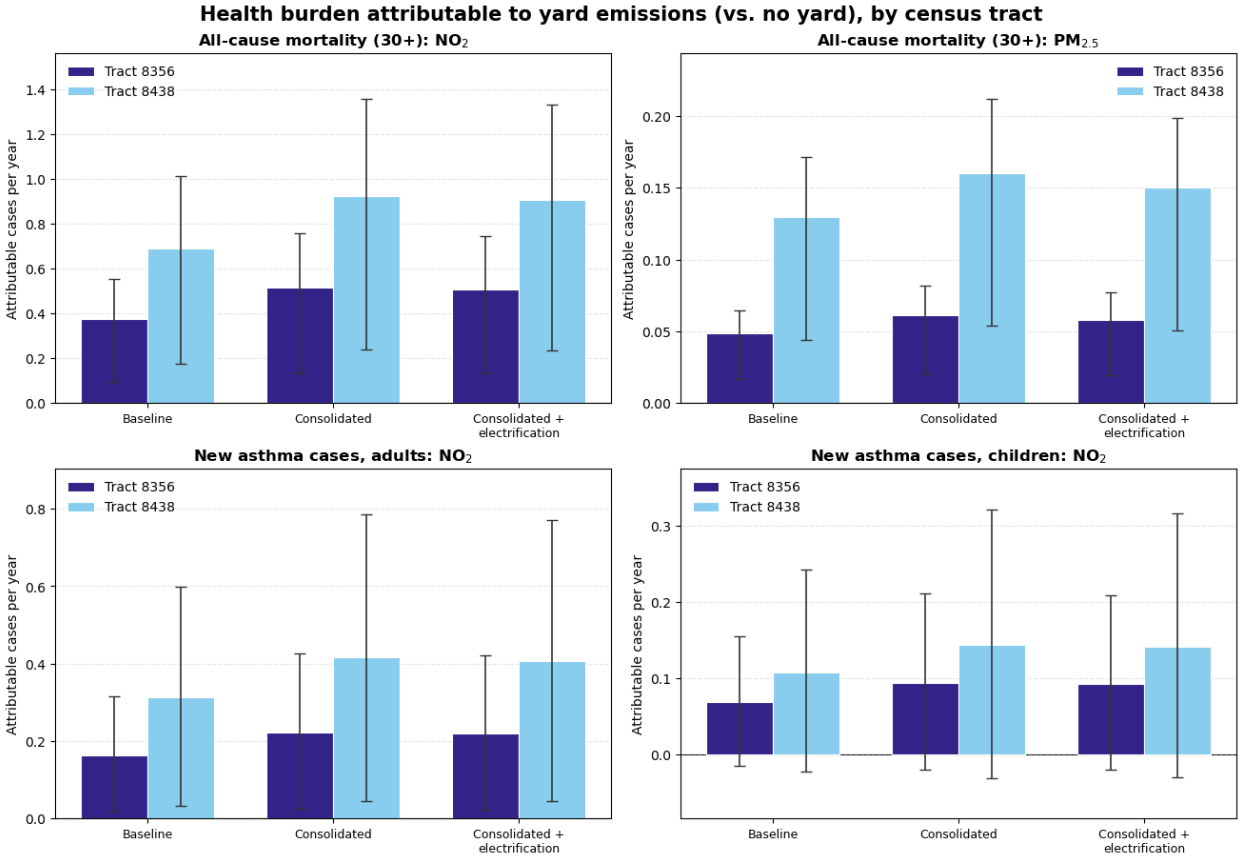

Figure E8. Health burdens for each scenario-pollutant combination for each target census tract.

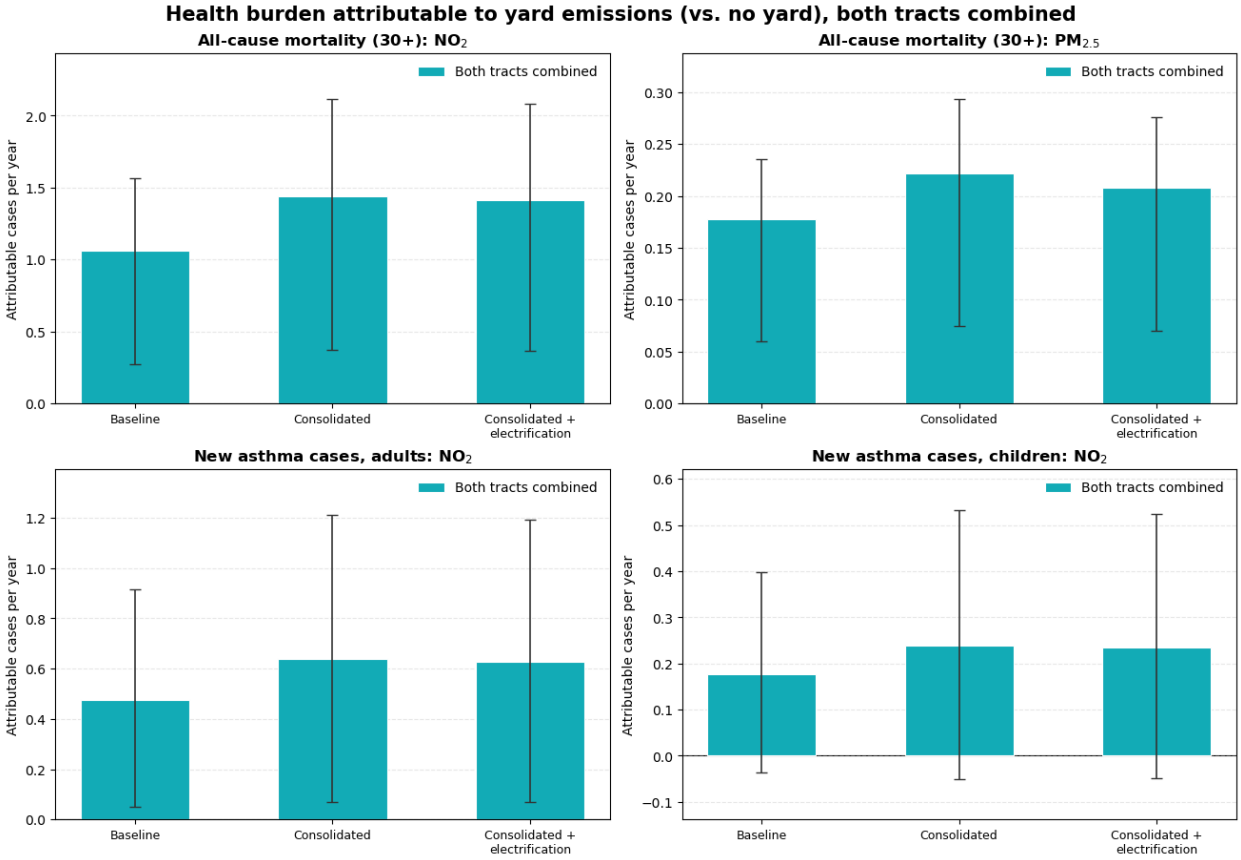

Figure E9. Health burdens for each scenario-pollutant combination for both census tracts combined.

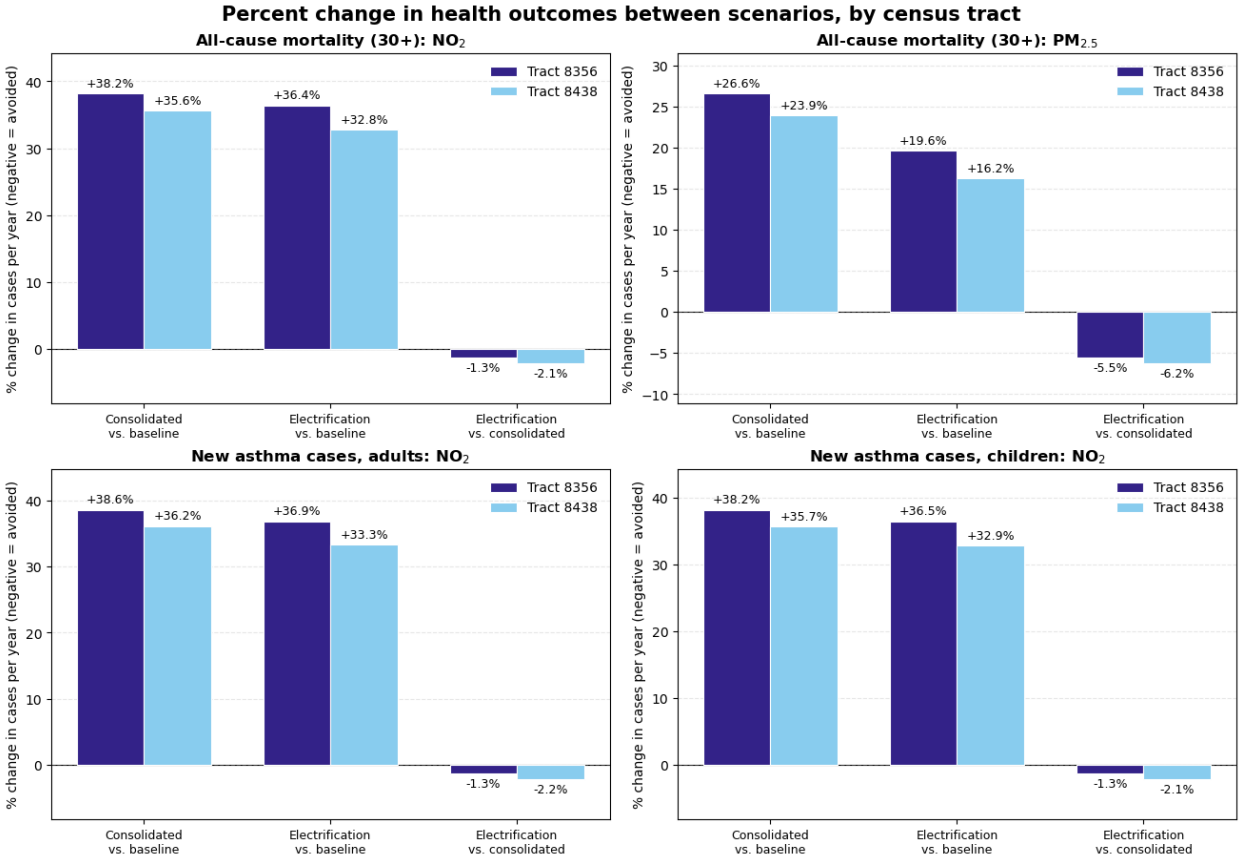

Figure E10. Change in health burdens for each scenario-pollutant combination for each target census tract.

Table E4. Health burden incidence, assuming a NO_2/NO_x ratio of 0.5.

Scenario / comparison	Mortality (30+), NO_2	Mortality (30+), $PM_{2.5}$	Adult asthma, NO_2	Child asthma, NO_2
Baseline burden (vs. no yard)	0.68 (0.174 to 1.01)	0.178 (0.06 to 0.236)	0.307 (0.0328 to 0.598)	0.113 (−0.0236 to 0.257)
Consolidated burden	0.922 (0.236 to 1.36)	0.221 (0.0747 to 0.294)	0.414 (0.0445 to 0.8)	0.153 (−0.0321 to 0.347)
Consolidated + electrification burden	0.906 (0.232 to 1.34)	0.208 (0.0703 to 0.276)	0.406 (0.0437 to 0.786)	0.15 (−0.0316 to 0.341)
Consolidated vs. baseline	0.247 (0.0629 to 0.367)	0.0438 (0.0148 to 0.0581)	0.112 (0.0118 to 0.223)	0.0411 (−0.00852 to 0.0949)
Electrification vs. baseline	0.231 (0.0587 to 0.342)	0.0305 (0.0103 to 0.0405)	0.105 (0.011 to 0.208)	0.0384 (−0.00796 to 0.0887)
Electrification vs. consolidated	−0.0167 (−0.0248 to −0.00423)	−0.0133 (−0.0177 to −0.00449)	−0.00766 (−0.0153 to −0.0008)	−0.00272 (−0.00633 to 0.000561)

Table E5. Health burden incidence, assuming a NO_2/NO_x ratio of 0.9.

Scenario / comparison	Mortality (30+), NO_2	Mortality (30+), $PM_{2.5}$	Adult asthma, NO_2	Child asthma, NO_2
Baseline burden (vs. no yard)	1.21 (0.312 to 1.79)	0.178 (0.06 to 0.236)	0.541 (0.0588 to 1.03)	0.201 (−0.0425 to 0.452)
Consolidated burden	1.64 (0.424 to 2.41)	0.221 (0.0747 to 0.294)	0.725 (0.0799 to 1.36)	0.271 (−0.058 to 0.604)
Consolidated + electrification burden	1.61 (0.417 to 2.37)	0.208 (0.0703 to 0.276)	0.712 (0.0785 to 1.34)	0.267 (−0.057 to 0.595)
Consolidated vs. baseline	0.444 (0.113 to 0.657)	0.0438 (0.0148 to 0.0581)	0.201 (0.0213 to 0.395)	0.0737 (−0.0153 to 0.169)
Electrification vs. baseline	0.414 (0.106 to 0.613)	0.0305 (0.0103 to 0.0405)	0.188 (0.0199 to 0.37)	0.0689 (−0.0143 to 0.158)
Electrification vs. consolidated	−0.03 (−0.0446 to −0.00761)	−0.0133 (−0.0177 to −0.00449)	−0.0138 (−0.0276 to −0.00144)	−0.0049 (−0.0114 to 0.00101)

Appendix F:

CO_2 Emissions and Social Cost of Carbon

Table F1. CO_2 emissions by source and scenario.

Source	Baseline CO_2 (t/yr)	Consolidation CO_2 (t/yr)	Electrification CO_2 (t/yr)
Yard trucks	817	980	314
Cranes	588	706	706
Mainline rail	890	990	990
Drayage trucks	875	1050	1050
Total	***3170***	***3726***	***3060***

Yard CO_2 emissions are 3170 t/yr at baseline and change by 566 t/yr under the consolidation scenario, equivalent to a change in social cost of $105,586 per year. Under electrification, this changes to -$20,954 per year, showing potential climatic benefits.

The annual social cost of each scenario is:

$$\text{Social cost (\$/yr)} = E_{CO_2}\ \text{(t/yr)} \times \text{SC-CO}_2\ \text{(\$/t)}$$

We use an SC-CO_2 of $190 per metric ton of CO_2 (2020 dollars, 2% discount rate)[64].

Table F2. Yard CO_2 emissions and social cost by scenario.

Scenario	CO_2 (t/yr)	Change vs. baseline (t/yr)	Social cost ($/yr)	Change vs. baseline ($/yr)
Baseline	3170	-	602,282	-
Consolidation	3726	556	707,868	105,586
Electrification	3060	-110	581,328	-20,954

Appendix G:

Table G1. Yard Truck Electrification Cost Analysis Assumptions

Parameter	**Assumption**	**Source**
Annual Operation	2,500 hours per yard truck	CARB 2023
Diesel Yard Truck Cost	$160,000	NACFE_2022
Battery-Electric Yard Truck Cost	$420,000	NACFE_2022
Charging Infrastructure	$150,000/station	NACFE_2022
Diesel Consumption	2.5 gal/hr	AECOM_2019
Battery-Electric Electricity Consumption	15 kWh/hr	AECOM_2019
Diesel Maintenance	$30/hr	AECOM_2019
Battery-Electric Maintenance	$20/hr	AECOM_2019
Diesel Price	$5.571/gal	EIA_diesel_2026
Electricity Price	$0.1405/kWh	EIA_electricity_2026

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CERTIFICATE OF SERVICE

I hereby certify that on November 18, 2026, a copy of the foregoing Sustainable Englewood Initiative's Opening Comments and Requests for Conditions was served on all parties of record on the service list for Docket No. FD 36873 by electronic mail.

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