Before the

SURFACE TRANSPORTATION BOARD

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Finance Docket No. 35087

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CANADIAN NATIONAL RAILWAY COMPANY AND GRAND TRUNK CORPORATION – CONTROL – E J & E WEST COMPANY

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VERIFIED STATEMENT OF

ROBERT J. ANDRES, P.E., PTOE

IN SUPPORT OF

PETITION TO REOPEN PURSUANT TO THE BOARD'S GOVERNING REGULATIONS AND ITS OVERSIGHT JURISDICTION

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1. My name is Robert J. Andres. I am a Principal Engineer and Senior Project Manager for Civiltech Engineering, Inc., which I co-founded in 1988. My business address is 450 E. Devon Ave., Suite 300, Itasca, IL 60143. I am a registered Professional Engineer ("P.E.") in the State of Illinois, as well as a certified Professional Traffic Operations Engineer ("PTOE"), which is a national traffic engineering certification.

2. I have a B.S. Civil Engineering (1972) and a M.S. Highway Engineering (1974) from the University of Illinois at Urbana-Champaign. I have been employed in private consulting engineering since 1974. Prior to co-founding Civiltech, I served for 11 years as Project Engineer, Project Manager, and Phase I Services Department Head for Midwest Consulting Engineers, Inc. Before

that, I worked four years as a Project Engineer for Metcalf & Eddy, Inc. I have completed more than 50 environmental assessment and combined design reports for projects ranging in complexity from simple intersection channelization projects to major urban arterial improvements. In addition to Phase I engineering studies, I specialize in feasibility studies, traffic engineering and traffic signal and signal system design.

3. Civiltech has extensive experience working with the VISSIM traffic simulation program. VISSIM is a powerful microscopic time step and behavior-based simulation program developed to model urban traffic and rail operations. The program models individual driver behaviors and the resulting vehicle interactions to realistically simulate the performance of actual traffic flows. Traffic and rail operations are modeled under actual constraints such as roadway and railway configurations, speed limits, traffic composition, vehicle characteristics, traffic signals, transit stops, train blockages, and driver behaviors, among others.

4. In May 2011, Civiltech was commissioned to prepare an update of a previous traffic impact study ("Barrington TIS") that the Village of Barrington commissioned in 2007 to evaluate the impacts of the proposed Canadian National (CN) Railway acquisition of the Elgin, Joliet & Eastern (EJ&E) Railway Company ("Acquisition"). The previous study compared existing conditions in 2007 to predicted 2015 vehicular traffic and 2015 post-Acquisition rail traffic in order to determine the effects of the Acquisition on traffic mobility and congestion in the Village. The current Traffic Impact Study Update ("TIS

Update"), which was finalized in September 2011, builds on the previous study's computer models and updates them based upon actual CN train operational data that was collected within the Village in 2011. This study also reviews the methodology employed by HDR in its *Village of Barrington Traffic Operational Analysis* ("VOBTOA"), which was relied upon by the STB's Section of Environmental Analysis ("SEA") in preparing the Final Environmental Impact Statement ("FEIS") for the Acquisition. The VOBTOA was prepared by HDR, Inc. ("HDR"), the STB's engineering consulting firm that assisted in the preparation of the environmental analysis and public documents.

5. As explained in the TIS Update, which I am sponsoring and which is attached hereto, it has five primary objectives. In addition to reviewing and analyzing HDR's methodology, Civiltech was asked to calculate the 24-hour delay impacts of the Acquisition at IL Route 59 and U.S. Route 14 in Barrington using the VISSIM computer modeling software program and to update the VISSIM analyses developed for the original Barrington TIS to reflect the characteristics of actual CN Railway train operations within the Village that Civiltech measured in May and June of 2011. Civiltech was also asked to determine the traffic operational benefits of constructing a grade separation at the intersection of U.S. Route 14 and the EJ&E line. In addition, Civiltech was asked to use the same VISSIM measurement tool to calculate the 24-hour delay impacts of the Acquisition at U.S. Route 34 in the City of Aurora and compare the delay values to those calculated in Barrington. The U.S. Route 34 crossing in Aurora was one of the two crossings for which the STB ordered CN

to pay a substantial portion of the cost of constructing the needed grade separations.

6. The technical studies and VISSIM modeling for the TIS Update were prepared by Civiltech staff under my direct supervision. I authored the report based on the findings of the technical studies.

7. Based on Civiltech's VISSIM analysis and the results stated in the TIS Update, it is my professional opinion that there are several significant material errors and omissions that led to incorrect or unsupported conclusions in the FEIS, served December 5, 2008, and in Decision No. 16, served December 24, 2008. Furthermore, HDR's methodology failed to accurately measure traffic delay impacts in Barrington. As the TIS Update demonstrates, application of the same criteria to U.S. Route 14 in Barrington as were applied to U.S. Route 34 in Aurora demonstrates that the impact of the Acquisition on U.S. Route 14 is as severe as the impact on U.S. Route 34.

8. By utilizing VISSIM in the VOBTOA, HDR purported to use a more sophisticated and accurate analysis tool to evaluate the unique traffic conditions in Barrington. However, HDR misapplied that tool, as highlighted below, in a way that led to the incorrect or unsupported conclusions in the FEIS.

9. HDR used VISSIM to only analyze A.M. and P.M. peak hours, which are unrepresentative times to measure CN train delays because they are times of voluntary CN train curfews. Limiting the analysis to two separate peak hours of the day also stripped the ability of VISSIM to measure the cumulative delay

impacts of multiple train events on the two rail lines. HDR's focus solely on A.M. and P.M. peak hours, rather than on a 24-hour period, vastly understated the total delay time attributed to CN's increased freight rail service and did not capture the compounding effect of twenty trains over an entire 24-hour period. This is because HDR's peak hour analysis quantified the effect of only two additional trains per day rather than 15 additional trains. In addition, HDR's VISSIM simulation actually shows that the queue created by a single train event in the P.M. peak hour failed to dissipate 20 minutes after the train passed, at which time the simulation was stopped.

10. Civiltech's TIS Update also revealed that HDR compounded its analysis error by averaging vehicle delays over all 5.8 miles of Village streets contained in the HDR VISSIM model. HDR's model contains streets that are well beyond the areas affected by train delays. By including roadway segments that are far removed from the EJ&E crossings, HDR further diluted the impact of additional CN freight traffic in the Village.

11. By limiting the hours over which delays were measured and averaging them over a large area of the street network, HDR understated the impact on local transportation systems of the greatly increased number of freight trains running through Barrington. Without a sophisticated understanding of the VISSIM program, readers of the VOBTOA who are not familiar with the VISSIM process would likely fail to appreciate that the program was narrowly applied and the results were reported in a misleading manner. Thus, without that specialized knowledge, most readers would erroneously conclude that the

VOBTOA proved that there would be little impact from additional freight train traffic in Barrington (i.e. only a 4% to 5% increase) and that the VOBTOA validated the rudimentary analysis procedure used in the FEIS.

12. Given the STB's criterion for "substantial effect" of an increase caused by the Proposed Action of 40 or more hours of total vehicle delay measured over a 24-hour period, there is no rational basis for ignoring 22 hours of the day in order to focus only on the A.M. and P.M. peak hours when performing a traffic study to determine the delay caused by increased rail traffic. In order to present an accurate assessment of the Acquisition's impact, HDR should have focused on the impact of CN's increased traffic over a 24-hour period, which reflects CN's actual operations.

13. Based on my review of HDR's analysis and the documents that appear in the FEIS, I cannot find any indication that HDR ever acknowledged the dramatic discrepancy in conclusions reached between the 2007 Barrington TIS and their VOBTOA, or that they even drew the Board's attention to the fact that the 2007 Barrington TIS analyzed a complete 24-hour period, whereas their study analyzed only two peak hours. Since both studies utilized VISSIM to measure train delays, it is easy for a non-technical reader to get the wrongful impression that each study measured the same thing, when indeed they did not.

14. Nor does it appear that HDR advised the Board that its own data table (Table A.5-1 of the FEIS) incorrectly calculated 24-hour **Total Vehicle Traffic Delay Percent Increases** for all EJ&E crossings, which made the increases in

delay appear to be much smaller than they actually were. While most people would expect the term "percent increase" to mean the change in value of a term divided by the **initial** value of that term, HDR calculated percent increase as the change in value of the term divided by the **final** value of that term. Thus, for example at U.S. Route 34 (Ogden Avenue), Table A.5-1 of the FEIS reports a No-Action 24-hour total vehicle traffic delay of 1,132.8 minutes (initial value), a Proposed Action total delay of 4,377.0 minutes (final value), an increase in total delay of 3,244.2 minutes (change in value = 4,377.0 – 1,132.8), but a percent increase in total delay of 74% (i.e. 3,244.2 ÷ 4,377.0); when in fact the percent increase should have been 286% (i.e. 3,244.2 ÷ 1,132.8). **Thus, all of the Percent Increase values in Table A.5-1 of the FEIS are incorrect.** When the percentage increase calculations are correctly performed, the increase in delay at the U.S. Route 14 crossing from 149.4 minutes in the No-Action scenario to 1,757.8 minutes Proposed Action scenario (as reflected in Table A.5-1) constitutes an increase of ***1,177%***, as compared to an actual 286% increase at U.S. Route 34 (Ogden Avenue) and a 668% increase for U.S. Route 30 (Lincoln Highway), the two locations for which grade separations were ordered. HDR also failed to advise SEA and the Board that HDR's predicted peak period queue length increases of 1,550 feet at IL Route 59 and 2,100 feet at U.S. Route 14 would result in increases in traffic back-ups of between ¼ and ½ mile – a reality that would have demonstrated both the substantial effect of CN freight trains on vehicular mobility through Barrington and the misleading nature of HDR's peak period analysis.

15. Civiltech's 2011 VISSIM study, which is based on actual CN post-Acquisition operations in May and June of 2011 over the EJ&E, reveals the following:

- Using the high-level VISSIM traffic simulation model instead of SEA's rudimentary analysis procedure, the study found that both the IL Route 59 and the U.S. Route 14 crossings would be "substantially affected" by the Proposed Action according to STB criteria. Depending upon which future train scenario is utilized:
    - IL Route 59 would experience an increase in total 24-hour rail crossing delay of between 64 and 68 vehicle-hours as a result of the Acquisition. This is more than 50% greater than the STB substantial effect criterion.
    - U.S. Route 14 would experience an increase in total 24-hour rail crossing delay of between 116 and 122 vehicle-hours as a result of the Acquisition. This is 2 ½ to 3 times the STB substantial effect criterion.
- The VISSIM modeling in Barrington predicted a substantial benefit to the Village roadway network as a result of grade separating the U.S. Route 14 crossing. That grade separation would reduce 2015 total 24-hour vehicle delays on both IL Route 59 and U.S. Route 14 to nearly the levels expected under the No-Acquisition scenario.

16. Civiltech's 2011 VISSIM study of U.S. Route 34 in Aurora conclusively demonstrates that the impacts at the U.S. Route 14 crossing in Barrington are

equivalent to those that caused SEA to recommend grade separation mitigation at the Ogden Avenue crossing in Aurora. Civiltech's key comparative findings are as follows:

- The VISSIM model for U.S. Route 34 in Aurora predicted an increase in total 24-hour rail crossing delay of **114** vehicle-hours as a result of CN's freight traffic. SEA characterized the level of delay at this crossing as "excessive" (Final EIS page 4-16). Due in part to the magnitude of the delay increase, SEA recommended construction of a rail/highway grade separation at the U.S. Route 34 crossing.
- By comparison, the VISSIM model for U.S. Route 14 in Barrington predicted an increase in total 24-hour rail crossing delay of between **116** and **122** vehicle-hours as a result of CN's freight traffic.
- The magnitude of the delay increase at the U.S. Route 14 crossing is similar to the delay increase at U.S. Route 34, despite the fact that the Aurora crossing is projected to carry twice as many trains and 50% more roadway traffic than the U.S. Route 14 crossing. This result is due to the unique complexity of Barrington's street system and the delays caused by interactions with the crossing UP rail line that are not shared with other communities along the former EJ&E line.
- The U.S. Route 34 crossing in Aurora was cited by SEA in its recommendation to grade separate it as a heavily traveled SRA route that did not have any nearby available alternate routes. Barrington' s U.S.

Route 14 crossing is also a heavily traveled SRA route that does not have any nearby alternate routes that could be used to avoid train delays.

17. Civiltech also observed that although the Final EIS recognized on several occasions the importance of Strategic Regional Arterial (SRA) routes to regional mobility, it never mentioned the fact that U.S. Route 14 is an SRA route. Because the SRA designation was an important factor in determining the need for a grade separation at U.S. Route 34, U.S. Route 14's designation as such should have been given equal weight.

18. The opinions I have expressed in the report are based on the data derived from the VISSIM studies, as well as on my professional engineering experience, which has been gained through 37 years of practice in the field of traffic and transportation engineering as a consulting engineering. My experience includes working for all six county highway or transportation departments in Northeast Illinois, the Illinois Department of Transportation, the Illinois State Toll Highway Authority, the City of Chicago, more than 60 municipalities and numerous private developers preparing traffic studies, feasibility studies, preliminary engineering studies, environmental assessment studies and Phase I design studies for highway and site development projects.

FURTHER SAYETH THE AFFIANT NOT.

**VERIFICATION**

I, Robert J. Andres, P.E., PTOE, hereby declare under penalty of perjury that the foregoing is true and correct. Executed on September 8, 2011.

Robert J. Andres

Robert J. Andres, P.E., PTOE