Memorandum

To: Boulder County
From: Max Rusch, PE, PTOE, RSP1
Date: November 6, 2025
Re: CEMEX Longmont Lyons Plant – Traffic Study Evaluation

Introduction

This report is intended to assist Boulder County in determining whether to uphold the notice of termination of nonconforming status issued to the CEMEX Longmont Lyons Cement Plant in April 2024. The CEMEX plant was determined to be a nonconforming land use as a result of the findings from the *CEMEX Lyons Access Traffic Study*, published in 2023, which concluded that the closure of the Dowe Flats Quarry increased truck traffic to CEMEX and impacted traffic operations along CO-66. In response, the CEMEX plant submitted the *CEMEX Lyons Plant Traffic Study*, which stated that the change in truck volumes could be attributed to seasonal and annual fluctuations.

Boulder County engaged Stolfus & Associates, Inc. (Stolfus) to evaluate the previous traffic studies and available traffic data to assist them in determining whether to uphold the notice of termination of nonconforming status. Three traffic studies were provided by Boulder County for evaluation. For clarity, each study is referenced throughout this report as “Study 1”, “Study 2”, or “Study 3”. A summary of each report follows:

Study 1	Cemex Lyons Access Traffic Study
Date	August 28, 2023
Consultant	Stantec

Study 1 took a traditional traffic analysis approach and projected future conditions (2050) for the purpose of obtaining an access permit and assessing long-term traffic needs. It also evaluated traffic volumes for a “before” 2022 scenario and “after” 2023 scenario to determine the impacts that the closure of the Dowe Flats Quary had on truck volumes. Ultimately, this study provided recommendations to accommodate future traffic for the site. It also reported that because the 2023 volumes were higher than the calculated 2022 volumes, the closure of the Dowe Flats Quary had increased the truck volumes in and out of the CEMEX plant.

Study 2	Cemex Lyons Plant Traffic Study
Date	November 6, 2024
Consultant	Landis Evans & Partners

Study 2 analyzed historical volume and clinker production trends throughout the CEMEX plant’s operational history using data provided by the plant. The study provided estimated truck volumes from the years 1983-1993 and actual truck volumes from 2006-2022. The study also

provided clinker production volumes for 1983-1993 and 2014-2023. Ultimately, the study concluded that current truck traffic from the plant is lower than it was in the 1980's and 1990's, and that the findings from Study 1, indicating that the 2022 truck volumes were higher than the 2023 volumes, were due to seasonal and annual volume fluctuations.

Study 3	Traffic Impact Analysis – Dowe Flats Project
Date	May 1, 1993
Consultant	Felsburg Holt & Ullevig

Study 3 provided useful context regarding expected traffic conditions associated with the opening of the Dowe Flats Quarry. Notably, the forecasted conditions in the study were comparable to present day site traffic. However, this study was not critical in determining recent traffic growth at the site since it was completed for the purpose of identifying traffic impacts from the opening of Dowe Flats Quarry back in 1993. Although the assumptions made in this earlier study were reasonable, its relevance to evaluating post-closure traffic impacts from the Dowe Flats Quarry is limited.

Executive Summary

Our review of the three traffic studies concluded that the analyses were based on accurate data and reasonable assumptions, however, the "before" and "after" years that were evaluated in Study 1 and 2 were not appropriate the appropriate years to be evaluating. Our approach in reaching this conclusion is detailed below.

The CEMEX Longmont Lyons Cement Plant has site access on the south side of Ute Highway (CO-66), approximately 0.70 miles east of the intersection of US-36 & CO-66 in Longmont, CO. The previous CDOT access permit from 1997 allowed for a full movement access; however, the most recent access permit, dated May 2025, required that the access be modified to a ¾ movement, restricting left turns out from the site. A field visit conducted in September 2025 confirmed that the CEMEX site access is currently ¾ movement.

Stolfus took a data-driven approach to evaluate the three traffic studies provided by Boulder County by compiling and reviewing all available traffic and safety data presented in each study. The data was cross-referenced to identify inconsistencies between the studies and assessed for overall reliability and accuracy. No additional traffic or safety analyses were performed by Stolfus, other than an evaluation of the most recent five years of crash data for the site access. This report is therefore based solely on the evaluation of data and findings within the three studies provided by Boulder County.

While Studies 1 and 3 provide truck volume data for selected days, Study 2 provides truck data over many years of site operations. In addition, it provided clinker production data and a more

comprehensive analysis of the site history and changes in mode of materials and product transport. Study 2 states:

"*Data for 1994 through 2013 is not included on the graph because, during this timeframe, the mode of materials and product transport was dissimilar to that of the pre-1994, i.e., there was reduced inbound and outbound traffic due to the Dowe Flats raw material conveyor and the use of rail to transport finished product. Post 2018, reduced production from Dowe Flats and a cessation of rail transport resulted in increased truck traffic until the mode of transport, beginning in 2019, became substantially similar to the pre-1994 operating conditions.*"

From this information, it is our understanding that although the Dowe Flats Quarry officially closed in 2022, the conveyor belt and rail operations supplying materials to and from the cement plant began to phase out around 2014, with truck traffic becoming the primary mode of material transport by 2019. By 2022, it is likely that most, if not all material was being transported into and out of the site by truck. The figure below reports the annual clinker production and the annual truck volumes from Study 2. It should be noted that all the data in the figure below are actual reported volumes, except for the 2023 truck volumes, which were calculated in Study 2 based on the trends established from the previous few years.

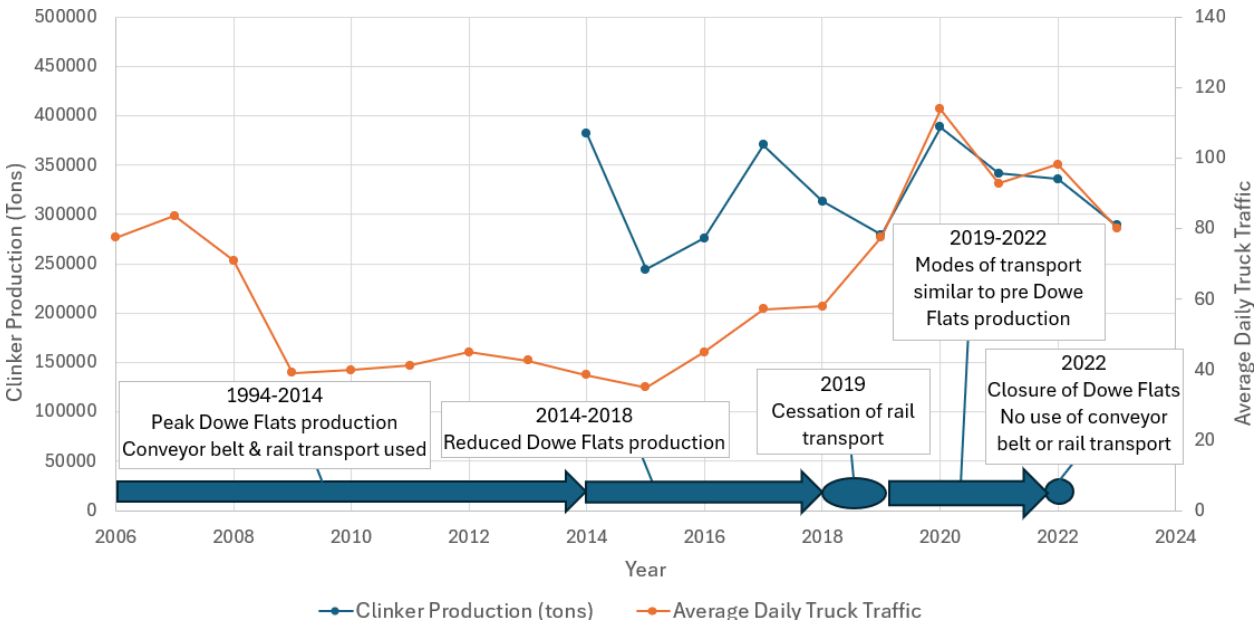

Figure 1: Historical Clinker Production and Daily Truck Volumes

As is clear from the figure, daily truck traffic between 2014 and 2018 was relatively low compared to clinker production, with a noticeable upward trend beginning in 2015. From 2018 to 2019, truck traffic increased significantly relative to the clinker production and then continued to mirror the clinker production in subsequent years. This indicates that as other modes of material transport were phased out beginning in 2014, with the rail transport stopping entirely after 2018, truck traffic increased relative to the clinker production. Although truck traffic was

much higher during the 2019–2023 period than in the 2014-2018 period, clinker production levels remained relatively constant. When comparing the annual averages between the 2014-2018 period and the 2019-2022 period, it was found that the average annual clinker production increased by 6% (318,012 tons per year to 336,379 tons per year) while the annual truck volume increased by 118% (10,992 trucks per year to 23,974 trucks per year).

The review of Studies 1 and 2 found that both analyses were based on accurate data and reasonable assumptions. However, after reviewing the clinker and truck volumes provided in Study 2, it was clear that the "before" and "after" years that were evaluated in each study were not appropriate. It is not accurate for Studies 1 & 2 to assume that the truck volumes from 2022 represent a "before" condition in which the Dowe Flats Quarry was operational, and 2023 represents an "after" condition where it had closed. By comparing these two years, the studies are essentially comparing two different "after" years. The studies should have used the 2014-2018 timeframe as the "before" conditions, since the conveyor belt and rail were transporting much of the material to and from the site, and the 2019-2023 timeframe as the "after" conditions, since the majority (or all) of the material was being transported to and from the site by truck.

Study 2 also reports that the truck volumes now are lower than in the 1980's and 1990's. While actual truck volumes are not provided, since the clinker volume production was higher back then, it is likely that truck volumes were higher prior to the opening of the Dowe Flats Quarry in 1994.

Evaluation

Boulder County had requested that the following topics be evaluated. While the executive summary addresses many of these topics, a direct response to each topic is provided below.

1. *Whether the methodology of each traffic study included in this Scope of Work is reliable or flawed. If the methodology is flawed, explain why.*

   Study 1
   The Cemex Lyons Access Traffic Study evaluated a before (2022), existing (2023), and future (2050) year. The methodology used to evaluate the 2023 and 2050 years is considered reliable, however, the methodology of using 2022 as a "before" condition to evaluate the impact that the closure of the Dowe Flats Quarry had on traffic operations is flawed. The Dowe Flats Quarry operations had largely ceased by 2022, so 2022 is essentially an "after" condition. This study should have use a year before 2019 as the "before" condition.

   Study 2
   The methodology in comparing the "before" 2019-2022 to the "after" 2023 conditions is flawed. As can be seen in the volume trends from the figure in the executive summary, by 2019, the rail line was no longer exporting material from the CEMEX plant, and the conveyor belt that imported raw materials from the Dowe Flats Quarry had slowed production. This study should have used 2014-2018 as the "before" conditions to accurately assess the impacts that the closure of the Dowe Flats Quarry had on truck traffic.

Study 3
The methodology of the 1993 traffic impact analysis is reliable since the study obtained traffic counts for existing conditions and analyzed existing, intermediate, and long-term traffic conditions using an industry standard traffic analysis approach. The project generated traffic section of this methodology may be less reliable as the assumptions made were not backed up with any evidence. While the methodology and data is considered generally reliable, this study is not as useful for determining the impact that the closure of the Dowe Flats Quarry would have on traffic operations, since the data included in this study is over 30 years old.

2. *Whether the statements of fact and conclusions reached in the letters and memos included in this Scope of Work are accurate. Do all statements and conclusions, especially those requiring engineering expertise, follow logically from the results of the traffic studies?*

Study 1
This study ultimately concludes that there was an increase in truck traffic from pre to post Dowe Flats Quarry closure. It also evaluates 20 year traffic growth with and without Cemex truck traffic, stating that the lefts out of the CEMEX plan will operate unacceptably by 2050. While the intersection operational analysis for each year (2022, 2023, 2050) is considered accurate, the volume comparison between 2022 and 2023 is not an accurate assessment of the impact that the closure of the Dowe Flats Quarry had, as discussed earlier in this report.

Study 2
The report states that truck volumes were higher in previous years/decades than the current truck volumes. While this is accurate, and the truck volumes in the 1980's and early 1990's were higher, the study does not state that the truck volumes have significantly increased from the 2014-2018 period, which also coincides with the closure of the rail and Dowe Flats Quary. It is also reported that the truck volumes in 2023 are lower than in 2020, 2021, and 2022, but this is because the clinker production in 2023 was also lower than in the previous three years, and does not negate the impacts that the closure of the Dowe Flats Quarry had on truck volumes.

Study 3
The analysis, completed in 1993 prior to the opening of the Dowe Flats Quarry, states that the opening of the quarry will serve solely to replace the existing rock supply and will not increase the plant's overall production capacity. It also notes that sourcing material from Dowe Flats will eliminate the need for truck traffic from more distant rock sources, thereby reducing overall truck vehicle-miles traveled. The study outlines the expected volume of truck traffic generated by the site and provides geometric recommendations aimed at minimizing traffic impacts along the highway. Many of these recommendations have already been implemented since the study's completion. Overall, the conclusions presented are consistent with the data and traffic evaluation conducted. Since the study assumes that the opening of the Dowe Flats Quarry will reduce truck trips, it can also be concluded that closing the quarry will increase truck trips.

3. *Whether the truck counts included in each traffic study included in this Scope of Work are consistent and accurate.*

   Study 1
   The truck counts presented in this study are consistent and accurate within the timeframe analyzed. However, the data represents only a limited snapshot and does not reflect broader historical traffic patterns. As such, while valid for short-term analysis, the findings may not capture long-term trends. The study obtained three days of traffic counts in June 2023 and utilized statewide regional traffic models to forecast future growth based on the counts, both of which are standard methods in traffic analysis. CEMEX had provided truck trip data logs for the same dates as the traffic counts, which strengthens the reliability of the dataset by allowing for a direct comparison between observed traffic and site-specific truck activity. However, some limitations were identified. The truck trip data only included limestone and shale trips, which does not account for all truck movements associated with the site. Additionally, for the before condition, the study used an average of all limestone and shale trips for June 2022, which is a reasonable approach since relying on a single day of data from a prior year would not accurately reflect average conditions.

   Study 2
   Truck counts from the years 2006-2022 in this study are accurate as they were directly obtained from CEMEX logs. However, truck counts from 1983-1993 are less reliable since a linear regression equation using 2019-2022 truck volumes and clinker data were used to determine the historical truck counts. In addition, the year 2023 truck volumes were calculated based on trends from the previous years, however, the assumptions made for this calculation are considered to be sound.

   Study 3
   Truck counts in this study were estimated based on existing plant production. It was assumed that truck traffic from the previous supplier would be removed and traffic from the quarry would replace the existing truck traffic. This study assumed two different sized trucks that could be used and estimated the truck traffic for both scenarios. Overall, the projected truck counts from the opening of the quarry are consistent with previous plant production and estimates.

4. *Whether the statements and conclusions reached in the November 7, 2024, CEMEX Access Analysis Supplement Memo (Study 2) are consistent with the August 28, 2023, CEMEX Lyons Access Traffic Study (Study 1). If any statements or conclusions in the November 7, 2024, CEMEX Access Analysis Supplement Memo deviate from information included in the August 28, 2023, CEMEX Lyons Access Traffic Study, explain which statements and conclusions are most accurate and why?*

   The conclusions reached in these two studies are inconsistent. Study 1 evaluates traffic conditions before and after the quarry closure, focusing specifically on 2022 and 2023 data, as well as forecasted 2050 volumes. This study concludes that traffic volumes increased between 2022 and 2023. In contrast, Study 2 attributes the increase reported in Study 1 to a monthly fluctuation, as Study 1 only looked at several days of volumes. Study 2 calculated the annual 2023 truck volumes based on the 2023 clinker production and linear regression

equation from the 2019-2022 truck volumes and clinker data. This calculation generated a lower 2023 truck volume than in 2022 (and 2020 & 2021).

The key distinction between the two studies lies in the timeframe from which their data came from. Study 1 analyzes a two-year period (before and after closure), whereas Study 2 compares the calculated 2023 truck volumes to 2019-2022 volumes. Study 1 compares volume counts from three days in 2023 to calculated volumes in 2022, while Study 2 compares annual truck volumes in 2019-2022 to calculated 2023 volumes. While both methodologies are reasonable, due to the much broader range of data provided in Study 2, Study 2 likely has more accurate volumes. As previously mentioned, while the volumes in Study 2 are deemed accurate, the years selected for the "before" and "after" comparison are not the years that should have been used.

5. *Whether the amount of clinker formed during the production of Portland cement is an appropriate proxy for the amount of traffic entering and exiting the CEMEX Longmont Lyons Cement Plant. If clinker is an appropriate proxy, explain why. If not, or another raw or finished material would be a more accurate predictor of plant truck traffic, explain why.*

   Yes, clinker production is an appropriate proxy for estimating traffic entering and exiting the plant, as the data has been consistently recorded and the clinker production volumes align with the historical operational trends of the facility. The truck data provided by CEMEX from 2006–2022, in conjunction with clinker production data for the corresponding years, provide a sufficient and reliable basis for evaluating the effects of the quarry closure on traffic patterns. The primary way the clinker data was applied to this review was to establish that while the clinker production had generally remained consistent from 2014-2022, the truck volumes had significantly increased, thus indicating that the closure of the Dowe Flats Quary and rail had increased the truck volumes rather than an increase in production from the CEMEX plant.

6. *Whether excluding traffic data and analysis from 1994-2014 in the November 5, 2024 CEMEX Lyons Plant Traffic Study was an appropriate methodology and whether it affected the conclusion of the study.*

   Yes, this is an appropriate methodology as the methods of transport during this time period were different from current operations. It may have been useful to still use this data to determine how it changes the results and to demonstrate that the study's findings were not selectively framed. It should be noted that this study also excluded 2014-2018 from its comparison to the 2023 volumes, which was not appropriate, as the 2014-2018 period was likely the most accurate data set for the period before the closure of the Dowe Flatts Quary.

7. *Whether the crash data presented in the November 5, 2024 CEMEX Lyons Plant Traffic Study is an appropriate indication of whether increased truck traffic has created a hazard off the CEMEX Longmont Lyons Plant Cement Plant property.*

   Yes, the crash data appropriately indicates that increased truck traffic has not created a safety hazard in the area. Stolfus reviewed the most recent five years of crash data within

the project area and confirmed that only one crash occurred at the site access during this time and it did not involve a truck. It should also be noted that this crash data was collected for the time period when the CEMEX access was still full movement. Restricting the left turn out of the site will improve safety.

8. *Whether the data and conclusions reached in the May 1993 Traffic Impact Analysis (Study 3), Dowe Flats Project study are consistent with the data and conclusions reached in the November 5, 2024 CEMEX Lyons Plant Traffic Study (Study 2). If the data and conclusions of both studies are not aligned, explain why.*

   The truck trip projections presented in Study 3 are generally consistent with the truck traffic data reported in Study 2. The primary distinction between the two studies lies in the assumptions regarding vehicle types. Study 3 evaluated two scenarios based on different truck sizes, one using smaller trucks resulting in a higher number of trips, and another using larger trucks resulting in fewer trips. In contrast, Study 2 does not specify the truck sizes considered. The average daily truck trips reported in Study 2 fall between the projections for the small and large truck scenarios from Study 3. Specifically, Study 3 anticipated approximately 11 trucks per hour, and up to 14 trucks per hour during peak season under the larger truck scenario. These figures align closely with the 2023 data logs provided by Cemex, which indicate a peak of 14 trucks entering the site per hour.