MEMORANDUM

To: Onyx Jones, Assistant City Manager
From: Zander Dally, AICP & Darryl DePencier, AICP: Kimley-Horn & Associates, Inc.
Project: MOVE Culver City Independent Data Validation
Date: 1 November 2022
Subject: Results of Move Culver City Independent Data Validation

INTRODUCTION:

This memorandum discusses the results and findings of the MOVE Culver City Independent Data Validation completed by Kimley-Horn and Associates, Inc (project team). The project team reviewed four monthly Key Performance Indicator (KPI) Reports from January 2022 to April 2022, which track the usage and impacts of the MOVE Culver City Tactical Mobility Lanes across seven different metrics for multiple modes.

The project team was able to consistently reproduce the results presented in the KPI reports. Some of the methods require documentation, particularly where source data required interpolation or interpretation. The methods used to create the report are consistent with industry standards and used the best data available to the consultant at the time of report creation.

The figures from these reports are compared to two previous periods: pre-pandemic conditions, with data from late 2019, and pre-implementation conditions, which represent conditions in the same period from 2021. These reports were prepared by Sam Schwartz Engineering (consultant) who gathered the data and constructed the reports to be published. The project team was tasked with the following:

- **Verify that the figures presented in the reports can be reproduced with the raw data used to construct the reports.**
- **Verify that the source data is appropriate and usable.**
- **Verify that the methodology used to generate the figures presented is appropriate.**

The project team was provided the data by the consultant in the form of Microsoft Excel sheets. The project team then recreated the figures in the reports using the data that was provided. The project team also provided two rounds of questions on the data and methodology to the consultant, who then provided more detailed answers on data sources, collection methods, and methodology that was not present in the reports. The findings of the analysis are presented by topic below.

RESULTS BY TOPIC:

Transit Operations:
The provided analysis was reproducible and was conducted using appropriate data and methods. This metric calculates the on-time performance (OTP) of Culver CityBus since the project was implemented, and compares it to pre-pandemic and pre-implementation data. OTP is tracked by the percentage of trips that vehicles arrive/depart on time. The reports provided separate calculations for routes 1,5, and 7 and the circulator service. Circulator service did not operate in the pre-pandemic and pre-implantation periods, thus there are not any previous points of comparison for this data across study periods.

Reproducibility: The project team was able to reproduce the results in the reports using the data provided. This did not require any clarification from the consultant.

Data Accuracy and Appropriateness: The project team found that the data collected for this topic was appropriate. Data was obtained through Culver CityBus' Clever Devices collection platform calculations for ridership were shown in the spreadsheets and were consistent.

Appropriateness of Methodology: The methodology used to calculate the figures is consistent with industry practices and was reproducible. Calculations did not require adjustments or assumptions beyond the provided data.

Transit Ridership:
The provided analysis relies on the best data available, and uses appropriate assumptions and adjustments to calculate ridership. This metric is based on average daily transit ridership along the project corridor throughout the three study periods. Like transit operations, the reports provided separate calculations for routes 1,5, and 7 and the circulator service. Circulator service did not operate in the pre-pandemic and pre-implantation periods, thus there are not any previous points of comparison for this data across study periods. Ridership was tracked by both daily and weekly values. Also, not all circulator vehicles were equipped with automatic passenger counters, so ridership totals were counted both electronically and manually. The consultant chose to report circulator ridership based on manual counts, as this provided a complete data set.

Reproducibility: Methodology documentation was needed to support analysis results. The practices used to interpolate missing data are consistent with standard practice, but results cannot be reproduced without the algorithm used to complete the dataset. Once this was provided, the figures were reproducible using the methodology and example calculations that the consultant provided.

Data Accuracy and Appropriateness: The consultant indicated that a small number of stops weren't appropriately included or excluded from the project corridor, and thus the ridership calculations. The consultant indicated they will adjust the load calculations and update the monthly reports accordingly.

Appropriateness of Methodology: The consultant filtered raw ridership data for each month to obtain both ridership of each vehicle upon entering the corridor and boardings at each stop within the corridor separately. When summed together, this produced an overall corridor ridership value for the month, which was then converted to daily and weekly ridership values. The project team found this to be an appropriate methodology given the structure of the raw data.

Vehicle Travel Times:
The team was able to reproduce values very similar to those presented in the reports. The methodology is consistent with industry practices. This metric is based on the average travel time of vehicles throughout the corridor, and on surrounding major arterials, neighborhood streets, and a nearby section of the I-10 freeway during the three study periods and compares it to the pre-pandemic and pre-implementation periods. Data for this metric was collected using INRIX for the pre-pandemic period, and Waze for the pre-implementation and post-implementation periods. The raw data was processed using Tableau.

Reproducibility: The project team noted small variances in their results from those reported. The differences are not statistically significant, and are likely caused by rounding in different software packages.

Data Accuracy and Appropriateness: The data presented was complete and consistent. It collected counts from various locations and days in a consistent manner which did not require any interpolation to complete the dataset. Historical data was purchased from INRIX for a nominal fee for the pre-pandemic period, and more granular Waze data was used for the pre-implementation and post-implementation period, as it was complimentary to the City once they joined the Waze Connected Public Partnership program.

Appropriateness of Methodology: The methodology used to construct the figures is consistent with industry practice.

Vehicle Volumes:
The results of this analysis can be reproduced with the provided methodology. The analysis is consistent with industry practice. This metric tracks the average daily volumes for the entire corridor, as well as individual AM/PM peak hour volumes for several intersections in the corridor across the three study periods. Data for this metric was collected using GRIDSMART traffic cameras. Figures in this report were not published for pre-pandemic conditions, as data

was not available for this period. Only pre-implementation and post-implementation figures were compared. In addition, four locations were studied for the pre-implementation period, and two additional locations for the post-implementation period. Therefore, two locations do not have any point of comparison to a previous study period.

Reproducibility: Methodology documentation was needed to reproduce the results of this analysis because the raw data needs interpretation and some missing values need to be interpolated. Previously identified minor inconsistencies in tabulating average daily traffic volumes are being addressed by the consultant and will be corrected in subsequent reports.

Data Accuracy and Appropriateness: The data source was appropriate and largely complete. Equipment failure and/or events in the city led to some days being excluded from the data, in which data was interpolated from other days to complete the figures, which the project team found to be appropriate given conditions.

Appropriateness of Methodology: The methodology for this metric was appropriate and straightforward. The consultant should state what days were excluded from the report and provide justification for this decision for clarification purposes.

Pedestrian Volumes:
The project team was able to reproduce the results from the January and February reports, but did not have access to the methodology used to evaluate pedestrian volumes in March and April. Difficulties in data collection required a different evaluation method in January and February from the rest of the analysis period. This metric calculates average weekday and weekend pedestrian volumes at six locations along the corridor (the same six locations as vehicle volumes), as well as average weekday and weekend volume. This was compared to pre-implementation data, however, pre-pandemic data was not examined due to a lack of available data. Like vehicle volumes, only four of these locations were examined for pre-implementation data, meaning that two locations did not have a previous point of comparison.

Reproducibility: The project team was initially unable to produce the results as shown in the reports. Upon further explanation by the consultant, the appropriate figures were able to be reproduced.

Data Accuracy and Appropriateness: Upon first review, the project team noticed that while data for all days was collected, it was not consistent by location for each day. The consultant team indicated in the first round of questions that equipment failure led to some locations not being counted. Therefore, only days in which data collected form all six locations was used to interpolate a monthly value in the January and February reports, and thus the average weekday and weekend volumes.

Appropriateness of Methodology: The consultant team notified the project team that the methodology for completing pedestrian volumes was changed beginning with the March 2022 report, meaning that the initial versions of the report had one methodology for January 2022 and February 2022, and another for March 2022 and April 2022. Equipment failure led to a number of days being excluded from the analysis due to incomplete data across the various intersections. In February, counts for all locations were only obtained for five days of the month. Therefore, beginning with the March report, the methodology changed to avoid this issue. The consultant provided a spreadsheet which displayed the new methodology beginning in the March report, in which the calculated values matched what was published. The consultant also noted that a script was developed that appends the data sent to them on a daily basis via email, and automatically incorporates the data into the project database. Throughout the audit process, the consultant noted that some data was missing from the April report, which will be updated to reflect this data.

<u>Bicycle Volumes:</u>
Equipment failures created difficulty in data collection and analysis consistency. The methods used to create the report are the best available with the source data. This metric calculates average weekday and weekend bicycle volumes by location and for the corridor. Three locations were surveyed for this topic, instead of the six surveyed for vehicle and pedestrian volumes. This metric compared pre-pandemic and post-implementation data only. Values for pre-implementation were not provided due to this data not being available. Data was collected using manual bike counts for pre-pandemic data, and GRIDSMART cameras for post-implementation data.

Reproducibility: Methodology needs to be documented for this metric on how the source data was interpreted and interpolated to enable reproduction of these results. When provided the project team was then able to reproduce.

Data Accuracy and Appropriateness: Equipment failure of the GRIDSMART cameras meant that video feed of each intersection was collected, but the software that counts bicycles did not function. Therefore, the data was constructed using manual bike counts collected by watching the video feed. The data was not consistent over the various days and locations; therefore, the consultant used an extrapolation method to reach the figures published in the report.

Appropriateness of Methodology: Given the inconsistency of the days/times that data was collected, the consultant applied a k-factor of 0.1, which assumes that the volume during the peak hour is one tenth of the daily value. This is supported by research and is needed to develop an estimate with the available data.

Micromobility:
This metric is provided directly by the data vendor, which complies with the industry-developed Mobility Data Specification (MDS) standard (by all micromobility providers), so no interpretation or source data analysis was conducted. This metric calculates the number of shared mobility (e-scooter) usage in the Study Area (1/4 mile from downtown corridor and within Culver City limits). Post-implementation and pre-implementation data was compared. Pre-pandemic data was not compared in this analysis. Data for this analysis was provided by Populus, which tabulates data from various e-scooter operators into one source.

Reproducibility: The provided data was entered into the report as provided.

Data Accuracy and Appropriateness: This is the best available data, and it is in compliance with the MDS industry standard.

Appropriateness of Methodology: The calculations used to arrive at the figures published in the report are appropriate given the format of the source data.

RESULTS AND CONCLUSION:

Overall, the analysis showed that the data presented in the reports is appropriate, and the methodology used to construct the reports is sound and standard. The consultant used the best available data sources and made appropriate comparisons to pre-pandemic and pre-implementation data. The analysis revealed some minor errors in some data points which have been or are being corrected by the consultant. Some methods need to be documented more clearly, particularly where specific filters or interpolation/extrapolation methods were used to complete the data, as the results cannot be accurately recreated without knowledge of the methodology.