



Joseph M. Centorino, Inspector General

TO: Honorable Mayor and Members of the City Commission
FROM: Joseph M. Centorino, Inspector General

DATE: July 14, 2023
PROJECT: Trolley Ridership Inspection
OIG No. 23-11
PERIOD: October 1, 2021 - March 31, 2023

EXECUTIVE SUMMARY

This inspection was planned and carried out by the City of Miami Beach Office of the Inspector General (OIG) at the request of Miami Beach Commissioner Ricky Arriola, who expressed concerns regarding the accuracy of the reported ridership figures for the City's free trolley service. Those figures, presented to the July 22, 2022 Finance and Economic Resiliency Committee (FERC) meeting, had been based on an analysis of both manual counts recorded daily by trolley drivers and the Automatic Passenger Counters (APCs) installed in the trolleys and relied upon by the City Transportation and Mobility Department in connection with the 2019 Miami Beach Trolley Passenger Survey data performed by Marlin Engineering, Inc.

The City trolley contractor, Limousines of South Florida, Inc. (LSF), is responsible for operating the trolley system, and its subcontractor, TSO Mobile by Tracking Solutions Corp. (TSO Mobile), hired by LSF at the direction of the City, to provide hardware, software, and installation of the APCs, among other equipment. In addition, the City Transportation and Mobility Department is responsible for monitoring and determining compliance with the executed Agreement and Amendments with LSF.

OIG staff researched methodologies to test the reliability of the figures reported to the FERC and performed an independent inspection to assess the accuracy of the reported ridership data through visual examination of the limited available footage provided from video cameras installed in the trolleys. The ridership counts derived from the video footage inspection by OIG staff were then compared with the reported number of passengers from the APCs and the manual counts prepared by the trolley drivers. The inspection concluded that the data generated by the APCs installed in City trolleys and the manual counts prepared by the trolley drivers are unreliable indicators of the actual ridership for the trolley system, based on the sampled trolleys examined during March 2023.

Despite multiple requests, the OIG did not receive from the contractor all requested video footage or daily manual ridership counts prepared by trolley drivers. On some occasions, substitute video

footage of other non-requested trolleys was received instead of the requested footage. The contractor's failure to provide all the requested video footage created a scope limitation for this inspection. However, the Transportation and Mobility Department provided an Excel spreadsheet to the OIG, prepared by TSO Mobile, containing March 2023 trolley drivers' manual counts and APC counts, so that some additional analysis could be completed by OIG staff.



In the end, the OIG concluded that, due to the insufficiency of the camera footage provided; the lack of reliable data on which to draw any inference regarding overall ridership; and the skewing of the data due to the fact that among the nine trolleys tested, the ridership of one trolley was included three times (which happened to be the trolley which showed the greatest percentage discrepancy between the reported ridership and that observed by the OIG); no conclusion was warranted concerning the overall ridership in the system, including any assessment of whether the ridership count provided to the City was underreported or overreported. The OIG recommends that the City consider utilizing a more reliable technology for the counting of passengers on its trolley system.

Written responses to the draft report were received from the City Transportation and Mobility Department, LSF, and TSO Mobile. Some, though not all, of their comments have been incorporated into this final report. All responses received are attached to this report in their entirety.

INTRODUCTION

On May 8, 2014, the City of Miami Beach entered into an Agreement with LSF for turnkey operation and maintenance services of a Municipal Trolley System in the City of Miami Beach. According to City Resolution No. 2014-28708, the Agreement provided an option to procure additional equipment, including, without limitation, Global Positioning Systems with capabilities to report, Automatic Passenger Counters, Wi-Fi services, and Automated Voice Information Systems. Pursuant to Article 3, Section 1 of the agreement, the City Administration recommended that the City secure the optional equipment through LSF, for a sum not to exceed \$150,000, during the initial five-year term of the Agreement, which the Mayor and City Commission approved and authorized through Amendment No. 1.

Amendment No. 1 to the Agreement, approved on September 30, 2014, authorized the execution of a subcontract between LSF and TSO Mobile to equip the trolleys with the following optional equipment: Automatic Passenger Counters (APC), Automated Voice Information System, Wi-Fi services, real-time GPS tracking services (with capabilities to provide mileage, service hours and ridership reports, and capabilities to provide data in a format that is compatible with Miami-Dade County's mobile application, "Miami Dade Bus Tracker") and additional automated stop

announcement equipment, with the capability of displaying public advertisements. The OIG recommends that in the future the City enter into a contract directly with the subcontractor to enable direct access to the technology provider.

Exhibit B of LSF's contract with TSO Mobile, entered into at the recommendation of the City, states, "The accuracy of our Automatic Passenger Counting Systems is considered to exceed that of a single checker on board a bus and comparable to that obtained by two checkers, one stationed at each door. APC users in the transit systems that have utilized our APC system consistently express satisfaction with the accuracy of our APC system. In the following, the overall concurrence value represents the total number of boardings and alightings¹ counted by the APC system compared to the total number of boardings and alightings counted by experienced manual checkers. The Manual-APC Deviation Range +/- 1 represents the percentage of time the manual and APC observations were within one (1) of each other. Implementation of our APC system will result in APC Passenger Count Accuracy levels exceeding 95% concurrence with manual observations."

Transportation and Mobility Department management emphasized that the comparison of APC counts to a "single checker on board" is not meant to include the manual trolley driver counts, but there has been no practice to place single checkers on board other than the drivers that could provide the basis for a comparison. Therefore, the OIG relied upon its own visual inspection of riders entering and exiting the trolleys to determine compliance with the Amendment 1 Exhibit B standard cited above. The OIG's testing posited that, if the APC system report indicates 150 passengers rode a given trolley during the day based on the automatic counters, the manually observed video ridership counts by OIG staff should range between 149 and 151, most of the time (95%).

It is understandable that the accuracy of the manual counts performed by the trolley drivers may be affected by the other responsibilities of the driver throughout the day, including assisting passengers, driving, communicating with other LSF personnel, etc. Nonetheless, the fact that the manual counts by the drivers are utilized in place of the APC counts when the latter counts are unavailable, as indicated below, makes the accuracy of the trolley driver counts fair for comparison with the OIG counts.

Miami Beach trolley service was suspended on March 26, 2020, following the outbreak of the COVID-19 pandemic, and eventually resumed at a reduced service level on February 15, 2021. Therefore, the pre-pandemic analysis involved all trolley operations prior to March 26, 2020, and post-pandemic represented all trolley operations after February 14, 2021.

It is worth noting that the City does not base its payments to LSF on ridership but rather on scheduled service hours and established hourly rates as stipulated in Amendment 11 to the Agreement. Scheduled service hours are defined as the requested number of hours by the City for services available to the public for transport along designated routes.

Furthermore, the Transportation and Mobility Department stated that fleet size for the trolley system is based on desired frequency of service and service area, and not on ridership. The service hours exclude deadhead hours², interruptions in service, and idle times exceeding 15 minutes. The free Miami Beach trolley covers the following routes: South Beach Loop A and B,

¹ Alighting means to get out a vehicle, especially a train or a bus, according to the Cambridge English Dictionary.

² Deadhead hours refers to the measurement of time (in hours) when a vehicle travels from its garage or yard facility to the first scheduled pick-up point or any time the vehicle travels from the last scheduled drop-off point to its garage or yard facility.

Middle Beach Loop, Collins Express, and North Beach Loop (see Appendix A located at the end of this report).

The OIG believes that accurate ridership figures would be helpful in the City's overall assessment of the effectiveness of the trolley program, including the following:

- the number of trolleys that should be operating daily;
- identification of the busiest and least busy routes;
- the most productive hours of operation;
- assessment of the trolley program's appropriate funding level.

WORK PERFORMED

TEST 1

During the July 22, 2022, FERC meeting, the Transportation and Mobility Department presented post-pandemic trolley service metrics. The following presentation extract indicated that daily ridership had decreased by 56% from approximately 14,400 pre-pandemic daily riders to 6,300.

	Pre-pandemic	Current	% Change	FY23 enhancement (\$2.34 M)
Annual Cost	\$11.8 M	\$7.1 M	-41%	\$9.4 M
Operating Hours	18 hr./day	15 hr./day	-17%	15 hr./day
Service Frequency	15 min	30 min	100%	20 min
Ridership (daily/annual)	14,400/5.25 M	6,300/2.3 M	-56%	N/A
Cost/passenger	\$2.30	\$3.00	30%	N/A
No. of vehicles in service	25	15	-40%	21

Some ridership declines can likely be attributed to the changes in trolley operating hours and frequency. Prior to the pandemic, trolley service was available 18 hours a day, operating from 6 a.m. to 12 a.m., with 25 vehicles servicing the public at an average interval of 15 minutes. Following the pandemic, trolley service was initially reduced to 15 hours a day, operating from 8 a.m. to 11 p.m., with 15 vehicles servicing the public at an average interval of 30 minutes. The Transportation and Mobility Department informed the OIG that trolley service was subsequently expanded as of October 1, 2022, to include 21 vehicles servicing the public at an average interval of 20 minutes and operates from 8 a.m. to 11 p.m., which is the current service level.

TSO Mobile representatives informed OIG staff that its automatic counter system produces ridership reports that can be accessed through its <http://app.tsomobile.com> website. OIG staff accessed the corresponding Passenger Counter reports from October 1, 2021, through March 31, 2023, to compute the average daily and monthly ridership. The results indicated an average

of 5,205 daily riders from October 1, 2021, through September 30, 2022, and 6,232 daily riders from October 1, 2022 through March 31, 2023.

Upon comparing the limited internal TSO Mobile data provided to the OIG with the figures in the post-pandemic analysis presented by the City Transportation and Mobility Department to the FERC covering a broader period, the OIG found those figures to be consistent. As the trolley ridership data before July 1, 2021, was not available, it was not examined by the OIG, so its accuracy could not be determined.

TEST 2

OIG staff initially sought to determine the accuracy of the 14,400 daily ridership figures reported in the 2019 Passenger Survey conducted by Marlin Engineering Inc. However, TSO Mobile representatives informed the OIG that the 2019 trolley reports and related video footage were unavailable, and, therefore, the accuracy of the related reported ridership could not be verified. Given this limitation, OIG staff had to find an alternative method to assess the accuracy of reported ridership data and to test the reliability of the passenger counting system.

In response to initial inquiries made by OIG staff, representatives from Transportation America Inc. (TA), the parent company of LSF, stated that each trolley is outfitted with four interior cameras. The related video footage is stored on a hard drive within the camera system. Customers can only enter or exit the trolley through its one door, and the cameras record all its activities.

In emails to the OIG, TA representatives stated that the video recordings would be stored for approximately thirty days, thereby limiting the OIG's analysis to 2023 data. However, after requesting video footage related to the operation of nine trolleys, each operating during a single day within the prior thirty-day period, TA representatives indicated that video footage was only available for up to two weeks, although the Exhibit A of Amendment 5 of the agreement states a minimum period for the storage of recorded data of three weeks.

Consequently, OIG staff accessed the daily Passenger Counter reports from March 13 through March 19, 2023, within the designated two-week period, and similarly requested video footage of one day's activities for ten trolleys operating during the same week. The selected sample was stratified to focus primarily on trolleys with higher reported ridership and to avoid those out of service during the designated week.

After encountering unexpected difficulties obtaining the requested video footage, TA representatives provided OIG staff with USB flash drives containing most of the recordings. It is important to note that one trolley's video footage was unavailable, and substitute video footage was received for two other trolleys, which resulted in footage for three different days related to a single trolley, MB08, i.e., the footage provided for three out of the nine trolley days examined included the same trolley. The OIG utilized all of this footage but must note that, while the repeated use of footage for one trolley helped to confirm that trolley's inaccurate automatic counter, it would have been far preferable to have received footage for two other trolleys.

OIG staff examined approximately 135 hours of video footage pertaining to 4,326 riders, representing 9.4% of the 46,238 riders for the designated week. The number of passengers entering each trolley during the reviewed day was counted and recorded. The table below summarizes the identified variances between the TSO Mobile Passenger Counter reports and the OIG video footage counts:

Trolley	Date	Route *	TSO Mobile Report	Video Count **	Variance	Variance %
MB08	Thursday, March 16, 2023	South Beach Loop B	297	671	374	125.9%
MB08	Monday, March 13, 2023	Collins Express	301	710	409	135.9%
MB08	Saturday, March 18, 2023	Collins Express	373	643	270	72.4%
MB13	Wednesday, March 15, 2023	Collins Express	557	657	100	18.0%
MB15	Thursday, March 16, 2023	North Beach	417	416	(1)	-0.2%
MB18	Sunday, March 19, 2023	Collins Express	659	749	90	13.7%
MB28	Thursday, March 16, 2023	South Beach Loop B	790	388	(402)	-50.9%
MB30	Wednesday, March 15, 2023	South Beach Loop B	447	441	(6)	-1.3%
MB31	Friday, March 17, 2023	South Beach Loop A	373	311	(62)	-16.6%

* Trolleys may cover more than one route each day.

** The video count figures include each time the trolley driver entered the vehicle during the examined day as the APC counts would have done the same. The number of times that the trolley drivers was observed entering the vehicle during the sampled days above ranged from three for MB13 to 21 for MB30.

The widespread positive and negative variances between the TSO Mobile reports and the OIG video counts raise concerns about the accuracy of the rider counting process. Each variance, except for trolley MB15, exceeded the threshold deviation listed in Exhibit B of the TSO Mobile Contract, some significantly.

In addition, trolleys MB28, MB30, and MB31 were equipped with overhead people sensor APCs³, which Transportation and Mobility Department staff presented to the OIG as a newer and better technology than the one used on the other trolleys. As reported in the table above, the associated variances ranging from 6 riders (-1.3%) to 402 riders (-50.9%), failed to support the assertion that the newer technology is more accurate than the older technology. It also reported higher ridership than observed in the video footage related to all three sampled trolleys examined.

Consequently, the OIG recommends that the installation of overhead people sensor APCs for more trolleys be suspended until the reasons for these deficient counts can be determined and corrected. If not possible, other more effective counting methods should be researched and utilized prospectively.

Although the objective of the analysis performed was to assess the reliability of the APCs, the outcome of which suggests malfunctions leading to inaccurate reporting of ridership figures, the OIG was also concerned with the inability of TA to provide all requested footage and the occasional submittal of substitute unrequested footage. For example, video footage for an additional eight trolleys was requested from TA representatives on April 18, 2023, pertaining to dates ranging from April 10, 2023 through April 16, 2023, well within the 14 days designated by TA. On April 27, 2023, the OIG received an email from TA stating that three of the eight requested videos were obtained, three were unavailable, and they were in the process of obtaining the remaining two.

The OIG was also informed that trolley drivers perform daily manual ridership counts, which are compared with TSO Mobile counts, and used when the APC counts are not available. As a result, the OIG emailed TA representatives on April 27, 2023, requesting the March and April 2023 manual ridership counts, but no response was received.

In the interim, the OIG requested and received an Excel spreadsheet from the Transportation and Mobility Department, which was previously provided to the City by TSO Mobile, containing the

³ https://people-sensing.com/sites/default/files/counter_datasheet_apc-eco_engl.pdf

APC counts and the daily manual ridership counts prepared by trolley drivers operating in Miami Beach during March 2023. Consequently, the requested April 2023 video footage and daily manual ridership counts prepared by the trolley drivers were no longer pursued from TA.

The OIG Auditors' examination of the March 2023 Excel spreadsheet found that the APCs for 202 of the 723 line items were blank (27.9%), containing no count whatsoever. This suggests that APCs installed on many trolleys are not functioning and need repair. After eliminating the 202 blanks from analysis, the OIG compared the remaining 521 reported APC counts with the corresponding trolley drivers' manual counts. Although the +/- 1 benchmark stated in Exhibit B of Amendment No. 1 is meant to apply, according to Transportation Department staff, only to a possible manual account "by a single checker on board a bus" and not to the drivers' manual counts, it was still concerning to the OIG that only 5 of the 521 line items were within the stated benchmark.

It should be noted that, on those occasions where the APC devices are not functioning correctly and do not report any daily riders, the trolley drivers' manual counts are substituted by the contractor to represent ridership for those days until the devices are recalibrated and repaired, so it is not illogical to compare the reported APC counts to the trolley drivers' manual counts as a reasonable measure of their accuracy.

Although not tested by the OIG, it was recommended to the Transportation and Mobility Department Director in a telephone conversation with the OIG that designated staff monitor the submitted monthly Excel spreadsheets, if not already done, to ensure that the repair and recalibration of all malfunctioning APCs occurs within a reasonable time.

Three sampled trolleys, MB28, MB30, and MB31, were equipped with the overhead people sensor APCs containing cameras which provide a continuous view of the trolley drivers. The corresponding video footage reviewed by OIG staff found the reliance on manual counts prepared by trolley drivers questionable, as only one (MB30) of the six observed drivers of the examined sampled trolleys equipped with overhead people sensor APCs was noticed recording ridership counts through a clicker hanging from his neck. Although this is not conclusive evidence that manual counts were not recorded by the other trolley drivers, it does raise questions as to the origin and accuracy of the manual counts based on trolley driver input.

In a meeting with City staff and TA management, it was stated that the Agreement does not prescribe how trolley driver manual counts must be completed. Given the number of blanks in the APC counts for March 2023 (27.9%), the OIG believes that a defined methodology by which the manual counts are to be performed by the trolley drivers will help result in more accurate ridership figures reported to the City. As a result, it is recommended that these terms be prospectively negotiated and added to the next Agreement.

The OIG also compared its video counts from the sampled trolleys examined, each for one day's operation during the week of March 13 through March 19, 2023, with the manual counts prepared by the trolley drivers (see the table below). In doing so, it was determined that the trolley drivers' manual counts were similarly unreliable.

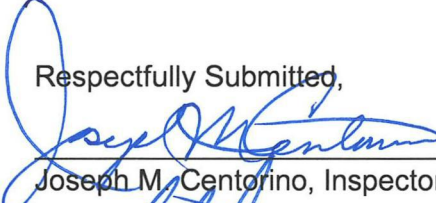
Trolley	Date	Route	Drivers Manual Counts	OIG Video Count	Variance	Variance %
MB08	Thursday, March 16, 2023	South Beach Loop B	604	671	-67	-11.1%
MB08	Monday, March 13, 2023	Collins Express	758	710	48	6.3%
MB08	Saturday, March 18, 2023	Collins Express	768	643	125	16.3%
MB13	Wednesday, March 15, 2023	Collins Express	985	657	328	33.3%
MB15	Thursday, March 16, 2023	North Beach	466	416	50	10.7%
MB18	Sunday, March 19, 2023	Collins Express	700	749	-49	-7.0%
MB28	Thursday, March 16, 2023	South Beach Loop B	364	388	-24	-6.6%
MB30	Wednesday, March 15, 2023	South Beach Loop B	318	441	-123	-38.7%
MB31	Friday, March 17, 2023	South Beach Loop A	380	311	69	18.2%

In sum, the documentation provided related to March 2023 showed widespread differences between the APC counts and the trolley drivers' manual counts. Furthermore, both counts differed, some significantly, from the OIG video counts performed on the daily activities of nine sampled trolley day-rides. Given the limited documentation received and the small sample in comparison to the population, the OIG cannot conclude whether the APC counts or the manual counts prepared by the trolley drivers are more accurate representations of ridership.

The OIG is also concerned that the City may have based some decisions regarding trolley service on these inaccurate ridership figures. Going forward, the Transportation and Mobility Department should periodically conduct its own sample ridership inspections with any deficiencies exceeding a designated percentage promptly addressed with the contractor until being resolved.

Based on the inspection done by the OIG and its communications with the City's Transportation and Mobility Department, LSF, and TSO Mobile, the OIG recommends that the City consider utilizing a more reliable technology for the counting of passengers on its trolley system.

Respectfully Submitted,



 Joseph M. Centorino, Inspector General

07/14/2023

 Date



 Norman Blaiotta, Deputy Chief Auditor

7/14/2023

 Date

- cc: Alina T. Hudak, City Manager
- Rickelle Williams, Assistant City Manager
- Jose R. Gonzalez, Transportation Department Director
- Nick Mazorra, COO, Limousines of South Florida, Inc.
- Wendy Diaz, Sr. Technical Support Manager, TSO Mobile by Tracking Solutions, Corp.
- Rafael Paz, City Attorney
- Mark Fishman, First Assistant City Attorney

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Appendix A

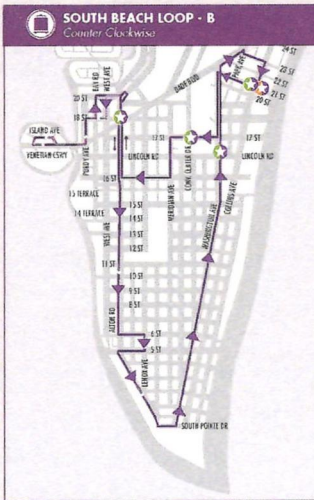
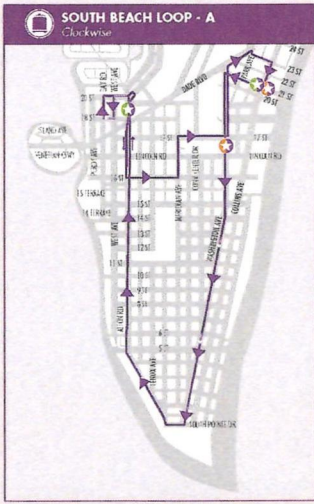
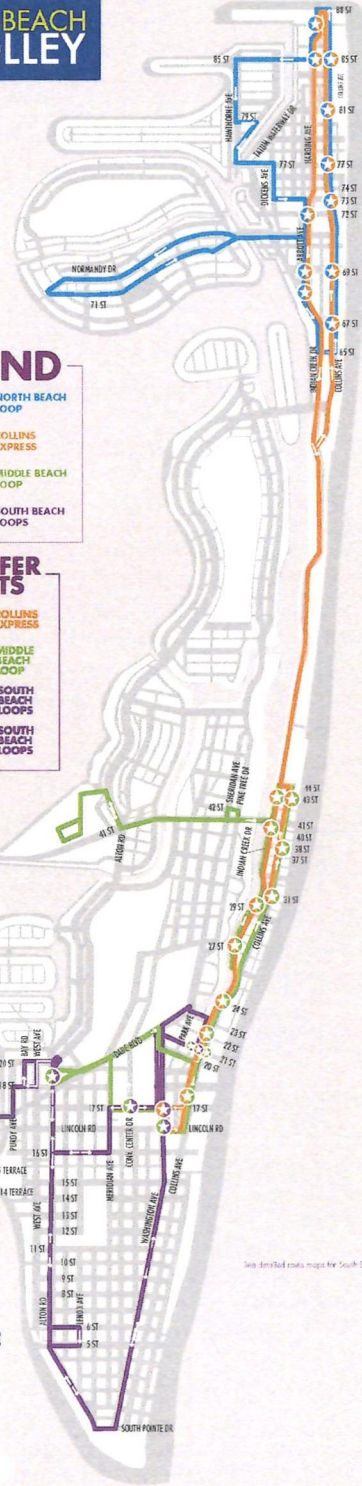


LEGEND

- NORTH BEACH LOOP
- COLLINS EXPRESS
- MIDDLE BEACH LOOP
- SOUTH BEACH LOOPS

TRANSFER POINTS

- NORTH BEACH LOOP
- COLLINS EXPRESS
- MIDDLE BEACH LOOP
- SOUTH BEACH LOOPS



See detailed route maps for South Beach Loops

For a full list of trolley stops visit: miamibeachtrolley.com

June 21, 2023

Joseph M. Centorino, Inspector General
The Office of Inspector General
City of Miami Beach
1130 Washington Avenue
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Miami Beach, FL 33139

Sent Via Email

JosephCentorino@miamibeachfl.gov

Re: LSF Response To Draft OIG Trolley Ridership Inspection Report

Dear Mr. Centorino:

Limousines of South Florida, Inc. (LSF) thanks the Office of Inspector General (OIG) for the opportunity that was provided to discuss the Draft Trolley Ridership Inspection Report (OIG Report) during the June 16, 2023 Virtual Meeting, by and between the OIG, City staff, and LSF, and to hereby submit Responses/Comments in connection thereto.

LSF is committed to ensuring that the public record provides a factual and accurate account of the issues discussed in the OIG's Inspection Report, inclusive of perspectives from all relevant parties – the OIG (as author of the Report), and the City staff and LSF as parties of the Miami Beach Trolley Program Agreement. To this end, attached please find LSF's Response To Draft OIG Trolley Ridership Inspection Report.

For purposes of clarity in the public record, LSF's response is provided within the text of the Draft OIG Report that was provided. Specifically, LSF provides comments in Blue Italics Font in response to each paragraph of the OIG Draft Report immediately after each paragraph in the Memorandum, so that the OIG can determine which responses will be incorporated into the Final OIG Report.

Consistent with Section 2-256. Sub-Section (h) of the Code of the City of Miami Beach, LSF respectfully requests that this complete Response be nonetheless attached to the Final OIG Report so that LSF's comments that are not incorporated into the OIG Final Report can be available for anyone that wishes to review LSF's Response/Comments.

If you have any questions, or require any further information, please do not hesitate to advise.

Sincerely,



Ray Gonzalez
President & CEO

Attachment

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LSF RESPONSE TO DRAFT OIG TROLLEY RIDERSHIP INSPECTION REPORT

(All LSF Responses/Comments are in Blue Italics Font)

For purposes of clarity in the public record, LSF provides comments in Blue Italics Font in response to each paragraph of the OIG Draft Report immediately after each paragraph in the Memorandum, so that the OIG can determine which responses will be incorporated into the Final OIG Report.

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TO: Honorable Mayor and Members of the City Commission
FROM: Joseph M. Centorino, Inspector General

DATE: June 2, 2023 **DRAFT**
PROJECT: Trolley Ridership Inspection
OIG No. 23-XX
PERIOD: October 1st, 2021 - March 31st, 2023

EXECUTIVE SUMMARY

This inspection was planned and carried out by the City of Miami Beach Office of the Inspector General (OIG) at the request of Miami Beach Commissioner Ricky Arriola, who expressed concerns regarding the accuracy of the ridership figures for the City's free trolley service. Those figures, presented to the Finance and Economic Resiliency Committee (FERC), had been based on the Automatic Passenger Counters (APCs) installed in the trolleys and relied upon by the City Transportation and Mobility Department in connection with the 2019 Miami Beach Trolley [Passenger Survey](#) data performed by Marlin Engineering, Inc.

LSF Comments (All LSF Comments are in Blue Italics Font)

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With respect to the substance of Paragraph 1 of the Executive Summary, LSF is aware of Commissioner Ariolla's concerns about the accuracy of ridership figures for the City's free trolley service. In observing Commissioner Arriola's specific concerns, as expressed from the Commission Dais, LSF notes his concerns that the published ridership figures may be inflated. In fact, based on his personal observations, Commissioner Arriola has speculated that ridership figures were potentially inflated, and has therefore, questioned whether the City should continue investing millions of dollars into a Program with lower-than-reported ridership figures.

In this regard, LSF notes that the OIG's Inspection did not conclude the City's trolley ridership figures are inflated. In fact, it was quite the opposite. During the designated one-week observation period conducted in March 2023, the OIG found that ridership figures were underreported by almost sixteen percent (16%). In other words, during the designated one-week period, the Trolley Program transported almost sixteen (16%) more passengers than reported by the APC equipment.

LSF respectfully submits that these details are highly probative, and should be disclosed in the opening paragraph of the OIG's Inspection Report.

The City trolley contractor, Limousines of South Florida, Inc. (LSF), is responsible for operating the trolley system, and its subcontractor, TSO Mobile by Tracking Solutions Corp. (TSO Mobile), is the independent party that installs and maintains the APCs. In addition, the City Transportation and Mobility Department is responsible for monitoring and determining compliance with the executed Agreement and its Amendments.

LSF Comments (All LSF Comments are in Blue Italics Font)

LSF notes that its sub-contract Agreement with TSO Mobile was entered into at the direction of the City. Please refer to Amendment No. 1 of the Miami Beach Trolley Program Agreement, entered on September 30, 2014, which states, in relevant part:

"The Contractor shall provide its Optional Services by entering into a Sub-contract with TSO Mobile..."

Accordingly, LSF respectfully requests that the OIG clarify this paragraph in the Draft OIG Report as follows:

*The City trolley contractor, Limousines of South Florida, Inc. (LSF), is responsible for operating the trolley system, ~~and its~~ **>>its<<** subcontractor, TSO Mobile by Tracking Solutions Corp. (TSO Mobile), is the independent party **>>contracted at the direction of the City<<** that installs and maintains the APCs. In addition, the City Transportation and Mobility Department is responsible for monitoring and determining compliance with the executed Agreement and its Amendments.*

*(Please note that for accuracy, LSF's suggestions that are stricken through are recommended to be deleted from the OIG Draft Report, and those that are **>>double arrowed and bold<<** are suggested by LSF to be added into the OIG Final Report.)*

OIG staff researched methodologies to test the reliability of those figures and performed an independent inspection to assess the accuracy of the reported ridership data through visual examination of the limited available footage provided from video cameras installed in the trolleys. The ridership counts derived from the video footage inspection by OIG staff were then compared with the reported number of passengers from the APCs and the manual counts prepared by the trolley drivers. The inspection concluded that the data generated by the APCs installed in City trolleys and the manual counts prepared by the trolley drivers are unreliable indicators of the actual ridership for the trolley system, based on the sampled trolleys examined during March 2023.

LSF Comments (All LSF Comments are in Blue Italics Font)

LSF notes that the installation of the APC's is performed by TSO.

To ensure that there is no misunderstanding as to which entity installs the equipment, LSF simply requests this paragraph in the Draft OIG Report be modified as follows:

*OIG staff researched methodologies to test the reliability of those figures and performed an independent inspection to assess the accuracy of the reported ridership data through visual examination of the limited available footage provided from video cameras installed in the trolleys. The ridership counts derived from the video footage inspection by OIG staff were then compared with the reported number of passengers from the APCs >>**installed by TSO**<< and the manual counts prepared by the trolley drivers. The inspection concluded that the data generated by the APCs installed >>**by TSO**<< in City trolleys and the manual counts prepared by the trolley drivers are unreliable indicators of the actual ridership for the trolley system, based on the sampled trolleys examined during March 2023.*

*(Please note that for accuracy, LSF's suggestions that are stricken through are recommended to be deleted from the OIG Draft Report, and those that are >>**double arrowed and bold**<< are suggested by LSF to be added into the OIG Final Report.)*

The OIG did not receive from the contractor, despite multiple requests, all requested video footage or daily manual ridership counts prepared by trolley drivers. On some occasions, substitute video footage of other non-requested trolleys was received instead of the requested footage. The contractor's failure to provide all the requested video footage created a scope limitation which raises concerns as to the underlying reasons why it was not furnished to the OIG and what other deficiencies may exist. However, the Transportation and Mobility Department provided an Excel spreadsheet, prepared by the contractor, containing March 2023 manual counts and APC counts to the OIG.

LSF Comments (All LSF Comments are in Blue Italics Font)

LSF apologizes for any delay in the delivery of requested information/data. As noted in the various email exchanges, LSF generally responded to communications by the OIG either on the same date or within a reasonable period. Regrettably, the process of obtaining the video footage was delayed either because of operational/service-related responsibilities and/or due to faulty/outdated equipment.

As LSF noted during the Virtual Meeting with the OIG and City staff, LSF provided the video footage that was available and/or operable as soon as staff was able to retrieve it. LSF and TSO have communicated to the City that the video equipment is outdated, and should be replaced. As also discussed, there is new and better passenger counter equipment and video technology available, and LSF is willing to test these new solutions.

Respectfully, the characterization that the unavailability of video footage "raises concerns as to the underlying reasons why it was not furnished to the OIG and what other deficiencies may exist" suggests the possibility of some improper conduct. This is simply not true, nor supportable in the OIG Report. In fact, as noted in Paragraph 1 of this Draft OIG Report, the basis for the Inspection Report is to assess the accuracy of the ridership figured of the City's free trolley service –

specifically, whether ridership was inflated. While the APCs and the manual counts have been determined unreliable, the Draft OIG Inspection Report did find that the numbers were underreported. Thus, there is no benefit for LSF to delay the production of requested video footage, and to suggest that any delay "raises concerns", or that there is an "underlying reason" for such delay is simply not necessary and misplaced.

As such, LSF respectfully requests that the OIG modify this paragraph in the Draft OIG Report as follows:

The OIG did not receive from the contractor, despite multiple requests, all requested video footage or daily manual ridership counts prepared by trolley drivers. On some occasions, substitute video footage of other non-requested trolleys was received instead of the requested footage. The contractor's failure to provide all the requested video footage created a scope limitation ~~which raises concerns as to the underlying reasons why it was not furnished to the OIG and what other deficiencies may exist.~~ However, the Transportation and Mobility Department provided an Excel spreadsheet, prepared by the contractor, containing March 2023 manual counts and APC counts to the OIG.

(Please note that for accuracy, LSF's suggestions that are stricken through are recommended to be deleted from the OIG Draft Report, and those that are >>double arrowed and bold<< are suggested by LSF to be added into the OIG Final Report.)



INTRODUCTION

On May 8, 2014, the City of Miami Beach entered into an Agreement with LSF for turnkey operation and maintenance services of a Municipal Trolley System in the City of Miami Beach. According to City Resolution No. 2014-28708, the Agreement provided an option to procure additional equipment, including, without limitation, Global Positioning Systems with capabilities to report, Automatic Passenger Counters, Wi-Fi services, and Automated Voice Information Systems. Pursuant to Article 3, Section 1 of the agreement, the City Administration recommended that the City secure the optional equipment through LSF, for a sum not to exceed \$150,000, during the initial five-year term of the Agreement, which the Mayor and City Commission approved and authorized through Amendment No. 1.

LSF Comments (All LSF Comments are in Blue Italics Font)

As noted previously, LSF's sub-contract Agreement with TSO Mobile was entered into at the direction of the City. Please refer to Amendment No. 1 entered on September 30, 2014, which

states, in relevant part:

"The Contractor shall provide its Optional Services by entering into a Sub-contract with TSO Mobile..."

Accordingly, LSF respectfully requests that the OIG clarify this paragraph in the Draft OIG Report as follows:

On May 8, 2014, the City of Miami Beach entered into an Agreement with LSF for turnkey operation and maintenance services of a Municipal Trolley System in the City of Miami Beach. According to City Resolution No. 2014-28708, the Agreement provided an option to procure additional equipment at the City's request, including, without limitation, Global Positioning Systems with capabilities to report, Automatic Passenger Counters, Wi-Fi services, and Automated Voice Information Systems. Pursuant to Article 3, Section 1 of the agreement, the City Administration recommended directed LSF to that the City secure the optional equipment through LSF, for a sum not to exceed \$150,000, during the initial five-year term of the Agreement, which the Mayor and City Commission approved and authorized through Amendment No. 1.

(Please note that for accuracy, LSF's suggestions that are stricken through are recommended to be deleted from the OIG Draft Report, and those that are >>double arrowed and bold<< are suggested by LSF to be added into the OIG Final Report.)

Amendment No. 1 to the Agreement, approved on September 30, 2014, authorized the execution of a subcontract between LSF and TSO Mobile to provide a full turnkey Trolley Service, to include equipping the trolleys with the following optional equipment: Automatic Passenger Counters (APC), Automated Voice Information System, Wi-Fi services, real-time GPS tracking services (with capabilities to provide mileage, service hours and ridership reports, and capabilities to provide data in a format that is compatible with Miami-Dade County's mobile application, "Miami Dade Bus Tracker") and additional automated stop announcement equipment, with the capability of displaying public advertisements. The OIG recommends that in the future the City enter into a contract directly with the subcontractor to help avoid the perception or the possibility that LSF may exert undue influence on its subcontractor to enhance its ridership figures and/or performance image.

LSF Comments (All LSF Comments are in Blue Italics Font)

LSF does not object to, nor particularly disagrees with the OIG's suggestion that the City should have direct contractual privity with an APC provider to provide ridership figures for the City's trolley program. However, LSF does object to the inaccurate suggestion that LSF may be exerting "undue influence on its subcontractor to enhance its ridership figures and/or performance data."

*In this regard, as prefaced earlier, LSF notes that **the City** selected TSO Mobile as its preferred APC vendor based on price, and per the previously quoted Amendment No. 1 to the Miami Beach Trolley Program Agreement, **directed** LSF to execute a subcontract with TSO. LSF believes this detail is critical to understanding the origin of the APC subcontract, and the nature of LSF's relationship with TSO.*

Moreover, LSF specifically asserts that there is no basis – in perception or in fact – that LSF may exert "undue influence on the sub-contractor to enhance ridership numbers". Indeed, as

explained during the Virtual Meeting with the OIG and City staff, LSF is compensated based on service hours – NOT by ridership. This fact is also actually acknowledged in a subsequent paragraph in the Draft OIG Inspection Report. In fact, during the Virtual Meeting, City staff also expressed this point, and further noted that the number of vehicles was/is not based on ridership figures; but rather, on desired head-way times and to minimize bunching.

It is therefore, frankly, ironic that the OIG would suggest that LSF would seek to exert undue influence and/or enhance ridership figures when there is clearly no benefit – financial or otherwise – for LSF to do so. In short, such language is unsupportable and unnecessarily inflammatory.

LSF therefore respectfully requests that the OIG modify this paragraph in the Draft OIG Report as follows:

*Amendment No. 1 to the Agreement, approved on September 30, 2014, authorized the execution of a subcontract between LSF and TSO Mobile to provide a full turnkey Trolley Service, to include equipping the trolleys with the following optional equipment: Automatic Passenger Counters (APC), Automated Voice Information System, Wi-Fi services, real-time GPS tracking services (with capabilities to provide mileage, service hours and ridership reports, and capabilities to provide data in a format that is compatible with Miami-Dade County's mobile application, "Miami Dade Bus Tracker") and additional automated stop announcement equipment, with the capability of displaying public advertisements. The OIG recommends >> – **and LSF concurs** – << that in the future the City enter into a contract directly with the subcontractor >>, **in order to directly oversee and manage the performance of the deployed technology.**<< ~~to help avoid the perception or the possibility that LSF may exert undue influence on its subcontractor to enhance its ridership figures and/or performance image.~~*

(Please note that for accuracy, LSF's suggestions that are stricken through are recommended to be deleted from the OIG Draft Report, and those that are >>double arrowed and bold<< are suggested by LSF to be added into the OIG Final Report.)

Exhibit B of the TSO Mobile Contract states, "The accuracy of our Automatic Passenger Counting Systems is considered to exceed that of a single checker on board a bus and comparable to that obtained by two checkers, one stationed at each door. APC users in the transit systems that have utilized our APC system consistently express satisfaction with the accuracy of our APC system. In the following, the overall concurrence value represents the total number of boardings and alightings¹ counted by the APC system compared to the total number of boardings and alightings counted by experienced manual checkers. The Manual-APC Deviation Range +/- 1 represents the percentage of time the manual and APC observations were within one (1) of each other. Implementation of our APC system will result in APC Passenger Count Accuracy levels exceeding 95% concurrence with manual observations."

LSF Comments (All LSF Comments are in Blue Italics Font)

LSF concurs with this paragraph.

In other words, if the APC system report indicates 150 passengers rode a given trolley during the day, the manual counts will range between 149 and 151, most of the time (95%). Furthermore,

¹ Alighting means to get out a vehicle, especially a train or a bus, according to the Cambridge English Dictionary.

both the manual counts and the APC system report counts should be consistently within the same +/- 1 deviation range with the video footage counts performed by OIG staff.

LSF Comments (All LSF Comments are in Blue Italics Font)

LSF concurs with this paragraph.

Miami Beach trolley service was suspended on March 26, 2020, following the outbreak of the COVID-19 pandemic, and eventually resumed at a reduced service level on February 15, 2021. Therefore, pre-pandemic analysis from LSF involved all trolley operations prior to March 26, 2020, and post-pandemic represented all trolley operations after February 14, 2021.

LSF Comments (All LSF Comments are in Blue Italics Font)

LSF concurs with this paragraph.

It is worth noting that the City does not directly base its payments to LSF on ridership but rather on scheduled service hours as stipulated in Amendment 11 to the Agreement. Scheduled service hours are defined as the requested number of hours by the City for services available to the public for transport along designated routes. The service hours exclude deadhead hours², interruptions in service, and idle times exceeding 15 minutes. The free Miami Beach trolley covers the following routes: South Beach Loop A and B, Middle Beach Loop, Collins Express, and North Beach Loop (see Appendix A located at the end of this report).

Among other benefits, accurate ridership figures are important to help the City Administration to determine the following:

- the number of trolleys that should be operating daily;
- identification of the busiest and least busy routes through which decisions could be made to add or reduce the number of trolleys or the hours of operation;
- whether program costs may be offset by grant funding based on the achievement of specific ridership targets; and
- assessment of the trolley program's overall effectiveness and its appropriate funding level.

The first two listed above could impact scheduled service hours, and, therefore, payments due by the City to LSF.

LSF Comments (All LSF Comments are in Blue Italics Font)

*LSF generally concurs with the first several sentences of this paragraph, but again stresses that routes are determined by the City, and have nothing to do with ridership figures. As LSF noted earlier, and City staff confirmed during the Virtual Meeting with the OIG and LSF, the number of trolleys necessary to provide the service was also determined by the City based on trolley route alignment, established headways/frequency of service, and to minimize bunching. Thus, the number of trolleys and service hours are not dependent on the number of passengers using the service, and ridership figures **have no impact** on the Trolley Program's service hours, or the amount of payments to LSF.*

² Deadhead hours refers to the measurement of time (in hours) when a vehicle travels from its garage or yard facility to the first scheduled pick-up point or any time the vehicle travels from the last scheduled drop-off point to its garage or yard facility.

Therefore, LSF respectfully requests that the OIG make the following modifications to this paragraph in the Draft OIG Report to ensure accuracy in the public record as follows:

*It is worth noting that the City does not directly base its payments to LSF on ridership but rather on scheduled service hours as stipulated in Amendment 11 to the Agreement. Scheduled service hours are defined as the requested number of hours by the City for services available to the public for transport along designated routes. The service hours exclude deadhead hours³, interruptions in service, and idle times exceeding 15 minutes. >>**Routes are determined by the City, and the number of trolleys necessary to provide the service was also determined by the City based on established headways and to minimize bunching. Thus, the number of trolleys and service hours are not dependent on the number of passengers using the service.**<< The free Miami Beach trolley covers the following routes: South Beach Loop A and B, Middle Beach Loop, Collins Express, and North Beach Loop (see Appendix A located at the end of this report).*

Among other benefits, accurate ridership figures are important to help the City Administration to determine the following:

- ~~• the number of trolleys that should be operating daily;~~
- ~~• identification of the busiest and least busy routes through which decisions could be made to add or reduce the number of trolleys or the hours of operation;~~
- whether program costs may be offset by grant funding based on the achievement of specific ridership targets; and
- assessment of the trolley program's overall effectiveness and its appropriate funding level

~~**The first two listed above could impact scheduled service hours, and, therefore, payments due by the City to LSF.**~~

*(Please note that for accuracy, LSF's suggestions that are stricken through are recommended to be deleted from the OIG Draft Report, and those that are >>**double arrowed and bold**<< are suggested by LSF to be added into the OIG Final Report.)*

WORK PERFORMED

TEST 1

During the July 22, 2022 FERC meeting, the City Transportation and Mobility Department presented post-pandemic trolley service metrics. The following [presentation extract](#) indicated that daily ridership had decreased by 56% from approximately 14,400 pre-pandemic daily riders to 6,300.

LSF Comments (All LSF Comments are in Blue Italic Font)

LSF concurs with this paragraph.

³ Deadhead hours refers to the measurement of time (in hours) when a vehicle travels from its garage or yard facility to the first scheduled pick-up point or any time the vehicle travels from the last scheduled drop-off point to its garage or yard facility.



Trolley Service Metrics

	Pre-pandemic	Current	% Change	FT23 enhancement (\$2.34 M)
Annual Cost	\$11.8 M	\$7.1 M	-41%	\$9.4 M
Operating Hours	18 hr./day	15 hr./day	-17%	15 hr./day
Service Frequency	15 min	30 min	100%	20 min
Ridership (daily/monthly)	14,400/5.25 M	6,300/2.3 M	-56%	N/A
Cost/passenger	\$2.30	\$3.00	30%	N/A
No. of vehicles in service	25	15	-40%	21



LSF Comments (All LSF Comments are in Blue Italics Font)

LSF concurs with this Chart.

Some ridership declines can likely be attributed to the changes in trolley operating hours and frequency. Prior to the pandemic, trolley service was available 18 hours a day, operating from 6 a.m. to 12 a.m., with 25 vehicles servicing the public at an average interval of 15 minutes. Following the pandemic, trolley service was reduced to 15 hours a day, operating from 8 a.m. to 11 p.m., with 15 vehicles servicing the public at an average interval of 30 minutes, which is the current service level.

LSF Comments (All LSF Comments are in Blue Italics Font)

LSF concurs with this paragraph.

TSO Mobile representatives informed OIG staff that its automatic counter system produces ridership reports that can be accessed through its <http://app.tsomobile.com> website. OIG staff accessed the corresponding Passenger Counter reports from October 1st, 2021, through March 31st, 2023, to compute the average daily and monthly ridership. The results indicated an average of 5,205 daily riders from October 1st, 2021, through September 30th, 2022, and 6,232 daily riders from October 1st, 2022 through March 31st, 2023.

LSF Comments (All LSF Comments are in Blue Italics Font)

LSF does not dispute the OIG's representations in this paragraph.

Upon comparing the limited internal TSO Mobile data provided to the OIG to the figures in the post-pandemic analysis presented by the City Transportation and Mobility Department to the FERC covering a broader period, the OIG found those figures to be consistent. As the trolley ridership data before July 1, 2021, was not available, it was not examined by the OIG, so its accuracy could not be determined.

LSF Comments (All LSF Comments are in Blue Italics Font)

LSF concurs with this paragraph.

TEST 2

OIG staff initially sought to determine the accuracy of the 14,400 daily ridership figures reported in the 2019 Passenger Survey conducted by Marlin Engineering Inc. However, TSO Mobile representatives informed the OIG that the 2019 trolley reports and related video footage were unavailable, and, therefore, the accuracy of the related reported ridership could not be verified. Given this limitation, OIG staff had to find an alternative method to assess the accuracy of reported ridership data and to test the reliability of the passenger counting system.

LSF Comments (All LSF Comments are in Blue Italics Font)

LSF does not dispute the OIG's representations in this paragraph.

LSF also adds that as discussed with the OIG and City staff, there is new and better passenger counter equipment and video technology available, and LSF is willing to test these new solutions.

In response to initial inquiries made by OIG staff, representatives from Transportation America Inc. (TA), the parent company of LSF, stated that each trolley is outfitted with four interior cameras. The related video footage is stored on a hard drive within the camera system. Customers can only enter or exit the trolley through its one door, and the cameras record all its activities.

LSF Comments (All LSF Comments are in Blue Italics Font)

LSF concurs with this paragraph.

In emails to the OIG, TA representatives stated that the video recordings would be stored for approximately thirty days, thereby limiting the OIG's analysis to 2023 data. However, after requesting video footage related to the operation of nine trolleys, each operating during a single day within the prior thirty-day period, TA representatives indicated that video footage was only available for up to two weeks.

LSF Comments (All LSF Comments are in Blue Italics Font)

LSF generally concurs with this paragraph, although to underscore a previous point, because the equipment is outdated, LSF has found that the maximum storage capacity of the memory card was unreliable to forecast. As such, LSF provided what was available.

LSF therefore respectfully requests that the OIG make the following modifications to the Draft OIG Report to this paragraph as follows:

In emails to the OIG, TA representatives stated that the video recordings would be stored for approximately thirty days, thereby limiting the OIG's analysis to 2023 data. However, after requesting video footage related to the operation of nine trolleys, each operating during a single day within the prior thirty-day period, TA representatives indicated that video footage was only available for up to two

weeks->>, as that is the maximum storage capacity of the outdated memory card.<<

(Please note that for accuracy, LSF's suggestions that are stricken through are recommended to be deleted from the OIG Draft Report, and those that are >>double arrowed and bold<< are suggested by LSF to be added into the OIG Final Report.)

Consequently, OIG staff accessed the daily Passenger Counter reports from March 13 through March 19, 2023, within the designated two-week period, and similarly requested video footage of one day's activities for ten trolleys operating during the same week. The selected sample was stratified to focus primarily on trolleys with higher reported ridership and to avoid those out of service during the designated week.

LSF Comments (All LSF Comments are in Blue Italics Font)

LSF does not dispute the OIG's representations of the methodology employed in the analysis.

After encountering unexpected difficulties obtaining the requested video footage, TA representatives provided OIG staff with USB flash drives containing most of the recordings. It is important to note that one trolley's video footage was unavailable, and substitute video footage was received for two other trolleys, which resulted in footage for three different days related to a single trolley, MB08, i.e., the footage provided for three out of the nine trolley days examined included the same trolley. The OIG utilized all of this footage but must note that, while the repeated use of footage for one trolley helped to confirm that trolley's inaccurate automatic counter, it would have been far preferable to have received footage for two other trolleys.

LSF Comments (All LSF Comments are in Blue Italics Font)

LSF does not dispute the OIG's representations of the methodology employed in the analysis, and agrees that it would have been far preferable to have received footage for two other trolleys.

OIG staff examined approximately 135 hours of video footage pertaining to 4,326 riders, representing 9.4% of the 46,238 riders for the designated week. The number of passengers entering each trolley during the reviewed day was counted and recorded. The table below summarizes the identified variances between the TSO Mobile Passenger Counter reports and the OIG video footage counts:

LSF Comments (All LSF Comments are in Blue Italics Font)

LSF does not dispute the OIG's representations of the methodology employed in the analysis.

Trolley	Date	Route *	TSO Mobile Report	Video Count	Variance	Variance %
MB08	Thursday, March 16, 2023	South Beach Loop B	297	661	364	122.6%
MB08	Monday, March 13, 2023	Collins Express	301	703	402	133.6%
MB08	Saturday, March 18, 2023	Collins Express	373	637	264	70.8%
MB13	Wednesday, March 15, 2023	Collins Express	557	654	97	17.4%
MB15	Thursday, March 16, 2023	North Beach	417	397	-20	-4.8%
MB18	Sunday, March 19, 2023	Collins Express	659	736	77	11.7%
MB28	Thursday, March 16, 2023	South Beach Loop B	790	378	-412	-52.2%

MB30	Wednesday, March 15, 2023	South Beach Loop B	447	420	-27	-6.0%
MB31	Friday, March 17, 2023	South Beach Loop A	373	297	-76	-20.4%

* Trolleys may cover more than one route each day.

LSF Comments (All LSF Comments are in Blue Italics Font)

LSF does not dispute the OIG's representations contained in the Chart prepared in connection with the OIG Draft Inspection Report.

The widespread positive and negative variances between the TSO Mobile reports and the OIG performed video counts raise concerns about the accuracy of the rider counting process. Each variance exceeded the threshold deviation listed in [Exhibit B](#) of the TSO Mobile Contract, some significantly.

LSF Comments (All LSF Comments are in Blue Italics Font)

LSF generally concurs with this paragraph, but again notes for the public record that there was no evidence of over-reporting of ridership figures – which is the primary stated reason for the OIG's Inspection Report

LSF therefore respectfully requests that the OIG modify this paragraph in the Draft OIG Report as follows:

*The widespread positive and negative variances between the TSO Mobile reports and the OIG performed video counts raise concerns about the accuracy of the rider counting process. Each variance exceeded the threshold deviation listed in [Exhibit B](#) of the TSO Mobile Contract, some significantly. >>**However, the review did not support a finding that LSF was over-reporting the number of passengers.**<<*

*(Please note that for accuracy, LSF's suggestions that are stricken through are recommended to be deleted from the OIG Draft Report, and those that are >>**double arrowed and bold**<< are suggested by LSF to be added into the OIG Final Report.)*

Also concerning is that Trolleys MB28, MB30, and MB31 were [equipped with overhead people sensor APCs](#)⁴, which Transportation and Mobility Department staff expected to produce more accurate results. The use of the overhead people sensor APCs was presented to the OIG as a newer and better technology than the one used on the other trolleys. As reported in the table above, the associated variances, ranging from -6.0% to -52.2%, failed to support this assertion. Consequently, the OIG recommends that the installation of new overhead people sensor APCs for more trolleys be suspended until the reasons for these deficient counts can be determined and corrected. If not possible, other more effective counting methods should be researched and utilized prospectively.

LSF Comments (All LSF Comments are in Blue Italics Font)

LSF concurs with this paragraph, and again adds that LSF has communicated to the OIG and City staff that there is new and better passenger counter equipment and video technology available, and LSF is willing to test these new solutions.

⁴ https://people-sensing.com/sites/default/files/counter_datasheet_apc-eco_engl.pdf

Although the objective of the performed analysis was to assess the reliability of the APCs, the outcome of which suggests malfunctions leading to inaccurate reporting of ridership figures, the OIG was also concerned with the inability of TA to provide all requested footage and the occasional submittal of substitute unrequested footage. For example, video footage for an additional eight trolleys was requested from TA representatives on April 18, 2023, [pertaining to dates ranging from April 10, 2023 through April 16, 2023](#), well within the 14 days designated by TA. On April 27, 2023, the OIG received an email from TA stating that three of the eight requested videos were obtained, three were unavailable, and they were in the process of obtaining the remaining two.

LSF Comments (All LSF Comments are in Blue Italics Font)

As noted in response to other paragraphs by the OIG discussing the unavailability of some video footage, LSF again apologizes for any delay in the delivery of requested information/data. As stated in the various email exchanges, LSF generally responded to communications by the OIG either on the same date or within a reasonable period. Regrettably, the process of obtaining the video footage was delayed either for operational reasons or due to faulty equipment. As LSF also noted during the Virtual Meeting with the OIG and City staff, LSF provided the video footage that was available and/or operable as soon as staff was able to retrieve it. LSF and TSO have communicated to the City that the video equipment is dated, and should be replaced. As also discussed, there is new and better passenger counter equipment and video technology available, and LSF is willing to test these new solutions.

The OIG was also informed that trolley drivers perform daily manual ridership counts, which are compared with TSO Mobile counts, and used when the APC counts are not available. As a result, the OIG [emailed TA representatives on April 27, 2023](#), requesting the March and April 2023 manual ridership counts, but no response was received.

LSF Comments (All LSF Comments are in Blue Italics Font)

LSF incorporates and re-states its Comments in response to the prior paragraph in the Draft OIG Report to this paragraph as well.

In the interim, the OIG requested and received an Excel spreadsheet from the Transportation and Mobility Department, which was previously provided to the City by the contractor, containing the APC counts and the manual ridership counts for trolleys operating in Miami Beach during March 2023. Consequently, the requested April 2023 video footage and the March through April 2023 daily manual ridership counts were no longer pursued from TA.

LSF Comments (All LSF Comments are in Blue Italics Font)

LSF incorporates and re-states its Comments in response to the prior paragraph in the Draft OIG Report to this paragraph as well.

The OIG compared the reported APC counts to the manual counts to determine whether each figure would be within +/- 1 of the other 95 times out of 100 (95% confidence level), as claimed in Exhibit B of the TSO Mobile contract. The OIG Auditors' examination of the provided March 2023 Excel spreadsheet found that the APCs for 202 of the 723 line items were blank (27.9%), containing no count whatsoever. This analysis suggests that APCs installed on many trolleys are not functioning and need repair.

LSF Comments (All LSF Comments are in Blue Italics Font)

LSF does not dispute the OIG's representations relative to the methodology utilized in the analysis. LSF and TSO have communicated to the City that the video equipment is dated, and should be replaced. As also discussed, there is new and better passenger counter equipment and video technology available, and LSF is willing to test these new solutions.

The trolleys equipped with the overhead people sensor APCs contained cameras which provide a continuous view of the trolley drivers. The OIG found the reliance on manual counts questionable, as none of the three sampled trolleys equipped with overhead people sensor APCs, showed the driver recording ridership counts during the days examined. Although this is not conclusive evidence that manual counts were not recorded by the trolley drivers, it does raise questions as to the origin and accuracy of the manual count, especially given the high number of blanks in the APC counts.

LSF Comments (All LSF Comments are in Blue Italics Font)

LSF generally concurs with this paragraph, and again adds that LSF has communicated to the OIG and City staff that there is new and better passenger counter equipment and video technology available, and LSF is willing to test these new solutions.

After eliminating the 202 blanks from analysis, the OIG compared the remaining 521 reported APC counts with the corresponding manual counts. It was determined that only 5 of the 521 line items compared in the Excel spreadsheet (0.96%) were within the +/- 1 benchmark stated in Exhibit B of the Agreement. The 0.96% correspondence between the APC and manual counts is far less than the stated 95% confidence level listed in the Agreement, further supporting the OIG's conclusion that reported ridership counts are unreliable.

LSF Comments (All LSF Comments are in Blue Italics Font)

LSF does not dispute the OIG's representations relative to the methodology utilized in the analysis, and adds that while the results of the inspections were unreliable, the ridership figures were underreported. LSF and TSO have communicated to the City that the passenger counter and video equipment is outdated, and should be replaced. As also discussed, there is new and better passenger counter equipment and video technology available, and LSF is willing to test these new solutions.

The OIG also compared its video counts from the sampled trolleys, each for one day's operation during the week of March 13 through March 19, 2023, with the manual counts prepared by the trolley drivers (see the table below). In doing so, it was determined that the manual counts were similarly unreliable. It is worth noting that four of the nine sampled trolley days resulted in the manual counts being lower than the OIG video counts (trolley MB08 on March 16, MB18 on March 19, MB28 on March 16, and MB30 on March 15).

LSF Comments (All LSF Comments are in Blue Italics Font)

LSF incorporates and re-states its Comments in response to the prior paragraph in the Draft OIG Report to this paragraph as well.

Trolley	Date	Route *	Drivers Manual Counts	OIG Video Count	Variance	Variance %
MB08	Thursday, March 16, 2023	South Beach Loop B	604	661	-57	-9.4%
MB08	Monday, March 13, 2023	Collins Express	758	703	55	7.3%
MB08	Saturday, March 18, 2023	Collins Express	768	637	131	17.1%
MB13	Wednesday, March 15, 2023	Collins Express	985	654	331	33.6%
MB15	Thursday, March 16, 2023	North Beach	466	397	69	14.8%
MB18	Sunday, March 19, 2023	Collins Express	700	736	-36	-5.1%
MB28	Thursday, March 16, 2023	South Beach Loop B	364	378	-14	-3.8%
MB30	Wednesday, March 15, 2023	South Beach Loop B	318	420	-102	-32.1%
MB31	Friday, March 17, 2023	South Beach Loop A	380	297	83	21.8%

LSF Comments (All LSF Comments are in Blue Italics Font)

LSF does not dispute the OIG's representations of the Chart prepared in connection with the analysis.

The analysis performed in this report indicates that the City incorrectly relied on the ridership figures submitted by TA in March 2023. The documentation provided showed widespread differences between the manual and APC counts, contrary to Exhibit B of the Agreement, and both differed from the corresponding OIG video counts performed on nine sampled trolley days. The OIG is also concerned that the City may have based some decisions on these inaccurate ridership figures, which may also have been reported to other governmental agencies. Going forward, the Transportation and Mobility Department should periodically conduct its own sample ridership inspections with any deficiencies exceeding a designated percentage promptly addressed with the contractor until being resolved.

LSF Comments (All LSF Comments are in Blue Italics Font)

LSF cannot opine on whether the City incorrectly relied on ridership data submitted by LSF in March of 2023. As noted previously, the unreliability of some data is generally based on outdated equipment and technology. In this regard, LSF has communicated to the OIG and City staff that there is new and better passenger counter equipment and video technology available, and LSF is willing to test these new solutions.

LSF further observes that the Agreement between the City does not prescribe any method for the collection of manual ridership counts. LSF further submits that manual counts provided by LSF drivers during the designated observation period were approximately 9.4%, which is consistent with industry standards and entirely reasonable given the other important duties assigned to trolley drivers. In this regard, LSF reiterates its concern with the suggestion that the City Commission may have "based some decisions on inaccurate ridership figures."

While not clearly stated, the OIG suggests that the City Commission may have allocated millions of tax dollars to fund a program with inflated ridership figures. This is just not accurate, as the OIG Inspection revealed that ridership figures during the designated observation period were underreported, not inflated. In addition, as noted above, ridership figures have not featured prominently in the City's decisions regarding trolley service hours and payments to LSF.

As to the OIG's concerns of the City basing some decisions on inaccurate ridership figures, again, City staff confirmed during the Virtual Meeting with the OIG and LSF, that the number of vehicles

used for routes and the number of service hours requested is not based, whatsoever, on ridership figures. Rather, City staff has stated that the number of trolleys determined for service by the City is based on established headways and to minimize bunching. Thus, the number of trolleys and service hours are not dependent on the number of passengers using the service.

LSF therefore respectfully requests that the OIG make the following modifications to this paragraph in the OIG Draft Report as follows:

~~The analysis performed in this report indicates that the City incorrectly relied on the ridership figures submitted by TA in March 2023. The documentation provided showed widespread differences between the manual and APC counts, contrary to Exhibit B of the Agreement, and both differed from the corresponding OIG video counts performed on nine sampled trolley days. The OIG is also concerned that the City may have based some decisions on these inaccurate ridership figures, which may also have been reported to other governmental agencies. Going forward, the Transportation and Mobility Department should periodically conduct its own sample ridership inspections with any deficiencies exceeding a designated percentage promptly addressed with the contractor until resolved.~~

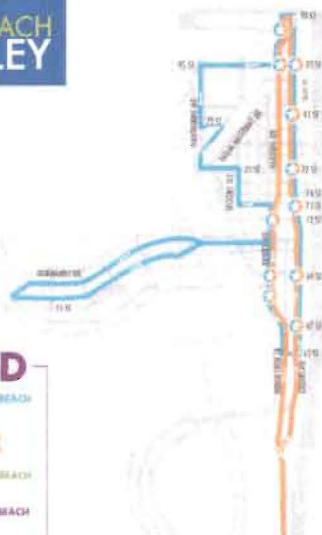
(Please note that for accuracy, LSF's suggestions that are stricken through are recommended to be deleted from the OIG Draft Report, and those that are >>**double arrowed and bold**<< are suggested by LSF to be added into the OIG Final Report.)

Joseph M. Centorino, Inspector General Date

Mark D. Coolidge, Chief Auditor Date

cc: Alina T. Hudak, City Manager
 Rickelle Williams, Assistant City Manager
 Jose R. Gonzalez, Transportation Department Director

Appendix A



Alonso, Elisa

From: Wendy Diaz <wdiaz@tsomobile.com>
Sent: Tuesday, July 11, 2023 2:50 PM
To: Centorino, Joseph
Cc: Dan Ocampo; Mark Gilmore; Rick Dunn (GPST)
Subject: Re: TSO Mobile Comment

[THIS MESSAGE COMES FROM AN EXTERNAL EMAIL - USE CAUTION WHEN REPLYING AND OPENING LINKS OR ATTACHMENTS]

Joseph,

I wanted to give you some comments on the current Audit for the City of Miami Beach. I wanted to make sure that it was understood that our hardware's performance is at times affected by issues the Trolley's may have. As an example our APC system requires an event of Door Open and Close so that we know they were passengers picked up. If the system does not receive the door open and close it will ignore the count that was just done. There are quite a few of the Trolleys that currently have the door mechanisms not working properly, thus the APC is not working properly. TSO is responsible to provide the service to visualize the results of the data obtained by the equipment, process any hardware failure/replacement when hardware is still under warranty (12 months) or offer an upgrade to the latest technology, in order to resolve issues and/or improve results. Any issues caused by tampering are not covered under warranty and it is the responsibility of LSF to maintain that portion (mechanic and working of the Trolleys). We have on many occasions helped LSF with these issues, because we value the City and we are all working together. TSO provides the hardware and installation of the same.

I do know that the City has trolleys still running the older technology for the Passenger Counters. The city has purchased some replacements that will be the newest technology and should be installed soon. We will install them in Trolley MB05 and MB07. Once they are installed you can re audit these for accuracy and notice the difference.

Thank you for your time.
Best Regards,

Wendy Diaz
TSO Mobile | a GPS Trackit company
Sr. Technical Support Manager
wdiaz@tsomobile.com | 1-877-477-2922 Ext. 1109

Transportation Department Response In Red Line To Draft Report



Joseph M. Centorino, Inspector General

TO: Honorable Mayor and Members of the City Commission
FROM: Joseph M. Centorino, Inspector General

DATE: June 2, 2023 **DRAFT**
PROJECT: Trolley Ridership Inspection
OIG No. 23-XX
PERIOD: October 1st, 2021 - March 31st, 2023

EXECUTIVE SUMMARY

This inspection was planned and carried out by the City of Miami Beach Office of the Inspector General (OIG) at the request of Miami Beach Commissioner Ricky Arriola, who expressed concerns regarding the accuracy of the ridership figures for the City's free trolley service. Those figures, presented to the Finance and Economic Resiliency Committee (FERC), had been based on an analysis of both manual (i.e. driver) counts and the Automatic Passenger Counters (APCs) installed in the trolleys and relied upon by the City Transportation and Mobility Department in connection with the 2019 Miami Beach Trolley [Passenger Survey](#) data performed by Marlin Engineering, Inc.

Commented [WR1]: To OIG: Should reference date when figures were presented to the FERC

The City trolley contractor, Limousines of South Florida, Inc. (LSF), is responsible for operating the trolley system, and its subcontractor, TSO Mobile by Tracking Solutions Corp. (TSO Mobile), is the independent party that installs and maintains the APCs. In addition, the City Transportation and Mobility Department is responsible for monitoring and determining compliance with the executed Agreement and ~~its~~ Amendments with LSF.

OIG staff researched methodologies to test the reliability of those figures and performed an independent inspection to assess the accuracy of the reported ridership data through visual examination of the limited available footage provided from video cameras installed in the trolleys. The ridership counts derived from the video footage inspection by OIG staff were then compared with the reported number of passengers from the APCs and the manual counts prepared by the trolley drivers. The inspection concluded that the data generated by the APCs installed in City trolleys and the manual counts prepared by the trolley drivers are unreliable indicators of the actual ridership for the trolley system, based on the sampled trolleys examined during March 2023. Based on the OIG's inspection of the limited video footage available, the APCs appear to be under-reporting actual ridership figures while the driver counts appear to be over-reporting actual ridership figures.

Commented [WR2]: Which figures?

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The OIG did not receive from the contractor, despite multiple requests, all requested video footage or daily manual ridership counts prepared by trolley drivers. On some occasions, substitute video footage of other non-requested trolleys was received instead of the requested footage. The contractor's failure to provide all the requested video footage created a scope limitation which raises concerns as to the underlying reasons why it was not furnished to the OIG and what other deficiencies may exist. However, the Transportation and Mobility Department provided an Excel spreadsheet, prepared by ~~the contractor~~ [TSO Mobile](#), containing March 2023 manual counts and APC counts to the OIG.



INTRODUCTION

On May 8, 2014, the City of Miami Beach entered into an [Agreement with LSF](#) for turnkey operation and maintenance services of a Municipal Trolley System in the City of Miami Beach. According to City Resolution No. [2014-28708](#), the Agreement provided an option to procure additional equipment, including, without limitation, Global Positioning Systems with capabilities to report, Automatic Passenger Counters, Wi-Fi services, and Automated Voice Information Systems. Pursuant to Article 3, Section 1 of the agreement, the City Administration recommended that the City secure the optional equipment through LSF, for a sum not to exceed \$150,000, during the initial five-year term of the Agreement, which the Mayor and City Commission approved and authorized through Amendment No. 1.

[Amendment No. 1](#) to the Agreement, approved on September 30, 2014, authorized the execution of a subcontract between LSF and TSO Mobile to provide a full turnkey Trolley Service, to include equipping the trolleys with the following optional equipment: Automatic Passenger Counters (APC), Automated Voice Information System, Wi-Fi services, real-time GPS tracking services (with capabilities to provide mileage, service hours and ridership reports, and capabilities to provide data in a format that is compatible with Miami-Dade County's mobile application, "Miami Dade Bus Tracker") and additional automated stop announcement equipment, with the capability of displaying public advertisements. The OIG recommends that in the future the City enter into a contract directly with the subcontractor [to enable direct access to the technology provider](#), ~~to help avoid the perception or the possibility that LSF may exert undue influence on its subcontractor to enhance its ridership figures and/or performance image.~~

[Exhibit B](#) of the TSO Mobile Contract states, "The accuracy of our Automatic Passenger Counting Systems is considered to exceed that of a single checker on board a bus and comparable to that obtained by two checkers, one stationed at each door. APC users in the transit systems that have utilized our APC system consistently express satisfaction with the accuracy of our APC system. In the following, the overall concurrence value represents the total number of boardings and

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alightings¹ counted by the APC system compared to the total number of boardings and alightings counted by experienced manual checkers. The Manual-APC Deviation Range +/- 1 represents the percentage of time the manual and APC observations were within one (1) of each other. Implementation of our APC system will result in APC Passenger Count Accuracy levels exceeding 95% concurrence with manual observations.”

In other words, if the APC system report indicates 150 passengers rode a given trolley during the day, the manual counts will range between 149 and 151, most of the time (95%). Furthermore, both the manual counts and the APC system report counts should be consistently within the same +/- 1 deviation range with the video footage counts performed by OIG staff.

Miami Beach trolley service was suspended on March 26, 2020, following the outbreak of the COVID-19 pandemic, and eventually resumed at a reduced service level on February 15, 2021. Therefore, pre-pandemic analysis from LSF involved all trolley operations prior to March 26, 2020, and post-pandemic represented all trolley operations after February 14, 2021.

It is worth noting that the City does not ~~directly~~ base its payments to LSF on ridership but rather on scheduled service hours and established hourly operating rates as stipulated in Amendment 11 to the Agreement. Scheduled service hours are defined as the requested number of hours by the City for services available to the public for transport along designated routes. Furthermore, fleet size for the trolley system is based on desired frequency of service and service area coverage, and not on ridership. The service hours exclude deadhead hours², interruptions in service, and idle times exceeding 15 minutes. The free Miami Beach trolley covers the following routes: South Beach Loop A and B, Middle Beach Loop, Collins Express, and North Beach Loop (see Appendix A located at the end of this report).

~~Among other benefits, accurate ridership figures are important to help the City Administration to determine the following:~~

- ~~the number of trolleys that should be operating daily;~~
- ~~identification of the busiest and least busy routes through which decisions could be made to add or reduce the number of trolleys or the hours of operation;~~
- ~~whether program costs may be offset by grant funding based on the achievement of specific ridership targets; and~~
- ~~assessment of the trolley program's overall effectiveness, and its appropriate funding level.~~

~~The first two listed above could impact scheduled service hours, and, therefore, payments due by the City to LSF.~~

Ridership figures are not used to determine the number of trolleys that should be operating, hours of operation, grant eligibility, or the appropriate funding level for the program.

WORK PERFORMED

¹ Alighting means to get out a vehicle, especially a train or a bus, according to the Cambridge English Dictionary.

² Deadhead hours refers to the measurement of time (in hours) when a vehicle travels from its garage or yard facility to the first scheduled pick-up point or any time the vehicle travels from the last scheduled drop-off point to its garage or yard facility.

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TEST 1

During the July 22, 2022 FERC meeting, the City Transportation and Mobility Department presented post-pandemic trolley service metrics. The following [presentation extract](#) indicated that daily ridership had decreased by 56% from approximately 14,400 pre-pandemic daily riders to 6,300.

	Pre-pandemic	Current	% Change	FY23 enhancement (\$2.34 M)
Annual Cost	\$11.8 M	\$7.1 M	-41%	\$9.4 M
Operating Hours	18 hr./day	15 hr./day	-17%	15 hr./day
Service Frequency	15 min	30 min	100%	20 min
Ridership (daily/annual)	14,400/5.25 M	6,300/2.3 M	-56%	N/A
Cost/passenger	\$2.30	\$3.00	30%	N/A
No. of vehicles in service	25	15	-40%	21

Some ridership declines can likely be attributed to the changes in trolley operating hours and frequency. Prior to the pandemic, trolley service was available 18 hours a day, operating from 6 a.m. to 12 a.m., with 25 vehicles servicing the public at an average interval of 15 minutes. Following the pandemic, trolley service was reduced to 15 hours a day, operating from 8 a.m. to 11 p.m., with 2145 vehicles servicing the public at an average interval of 30 minutes, which is the current service level.

TSO Mobile representatives informed OIG staff that its automatic counter system produces ridership reports that can be accessed through its <http://app.tsomobile.com> website. OIG staff accessed the corresponding Passenger Counter reports from October 1st, 2021, through March 31st, 2023, to compute the average daily and monthly ridership. The results indicated an average of 5,205 daily riders from October 1st, 2021, through September 30th, 2022, and 6,232 daily riders from October 1st, 2022 through March 31st, 2023.

Upon comparing the limited internal TSO Mobile data provided to the OIG to the figures in the post-pandemic analysis presented by the City Transportation and Mobility Department to the FERC covering a broader period, the OIG found those figures to be consistent. As the trolley ridership data before July 1, 2021, was not available, it was not examined by the OIG, so its accuracy could not be determined.

TEST 2

OIG staff initially sought to determine the accuracy of the 14,400 daily ridership figures reported in the [2019 Passenger Survey conducted by Marlin Engineering Inc.](#) However, TSO Mobile representatives informed the OIG that the 2019 trolley reports and related video footage were unavailable, and, therefore, the accuracy of the related reported ridership could not be verified.

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Given this limitation, OIG staff had to find an alternative method to assess the accuracy of reported ridership data and to test the reliability of the passenger counting system.

In response to initial inquiries made by OIG staff, representatives from Transportation America Inc. (TA), the parent company of LSF, stated that each trolley is outfitted with four interior cameras. The related video footage is stored on a hard drive within the camera system. Customers can only enter or exit the trolley through its one door, and the cameras record all its activities.

In [emails to the OIG](#), TA representatives stated that the video recordings would be stored for approximately thirty days, thereby limiting the OIG's analysis to 2023 data. However, after requesting video footage related to the operation of nine trolleys, each operating during a single day within the prior thirty-day period, TA representatives [indicated that video footage was only available for up to two weeks](#).

Consequently, OIG staff accessed the daily Passenger Counter reports from March 13 through March 19, 2023, within the designated two-week period, and similarly requested video footage of one day's activities for ten trolleys operating during the same week. The selected sample was stratified to focus primarily on trolleys with higher reported ridership and to avoid those out of service during the designated week.

After encountering [unexpected difficulties](#) obtaining the requested video footage, TA representatives provided OIG staff with USB flash drives containing most of the recordings. It is important to note that one trolley's video footage was unavailable, and substitute video footage was received for two other trolleys, which resulted in footage for three different days related to a single trolley, MB08, i.e., the footage provided for three out of the nine trolley days examined included the same trolley. The OIG utilized all of this footage but must note that, while the repeated use of footage for one trolley helped to confirm that trolley's inaccurate automatic counter, it would have been far preferable to have received footage for two other trolleys.

OIG staff examined approximately 135 hours of video footage pertaining to [4,326 riders, representing 9.4%](#) of the 46,238 riders for the designated week. The number of passengers entering each trolley during the reviewed day was counted and recorded. The [table below summarizes](#) the identified variances between the TSO Mobile Passenger Counter reports and the OIG video footage counts:

Trolley	Date	Route *	TSO Mobile Report	Video Count	Variance	Variance %
MB08	Thursday, March 16, 2023	South Beach Loop B	297	661	364	122.6%
MB08	Monday, March 13, 2023	Collins Express	301	703	402	133.6%
MB08	Saturday, March 18, 2023	Collins Express	373	637	264	70.8%
MB13	Wednesday, March 15, 2023	Collins Express	557	654	97	17.4%
MB15	Thursday, March 16, 2023	North Beach	417	397	-20	-4.8%
MB18	Sunday, March 19, 2023	Collins Express	659	736	77	11.7%
MB28	Thursday, March 16, 2023	South Beach Loop B	790	378	-412	-52.2%
MB30	Wednesday, March 15, 2023	South Beach Loop B	447	420	-27	-6.0%
MB31	Friday, March 17, 2023	South Beach Loop A	373	297	-76	-20.4%
		Total:	4,214	4,883	-669	-15.8%

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* Trolleys may cover more than one route each day.

The widespread positive and negative variances between the TSO Mobile reports and the OIG performed video counts raise concerns about the accuracy of the rider counting process. Each variance exceeded the threshold deviation listed in [Exhibit B](#) of the TSO Mobile Contract, some significantly. However, it is important to note that the OIG's limited review did not support a finding that APCs were over-reporting the number of passengers as the APCs appear to be under-reporting the number of passengers based on the video footage available.

In addition, also concerning is that Trolleys MB28, MB30, and MB31 were equipped with overhead people sensor APCs³, which Transportation and Mobility Department staff expected to produce more accurate results. The use of the overhead people sensor APCs which was presented to the OIG as a newer and better technology than the one used on the other trolleys. As reported in the table above, the associated variances, ranging from -6.0% to -52.2%, failed to support that the newer technology is more accurate than the older technology~~this assertion~~. Consequently, the OIG recommends that the installation of new overhead people sensor APCs for more trolleys be suspended until the reasons for these deficient counts can be determined and corrected. If not possible, other more effective counting methods should be researched and utilized prospectively.

Although the objective of the performed analysis was to assess the reliability of the APCs, the outcome of which suggests malfunctions leading to inaccurate reporting of ridership figures, the OIG was also concerned with the inability of TA to provide all requested footage and the occasional submittal of substitute unrequested footage. For example, video footage for an additional eight trolleys was requested from TA representatives on April 18, 2023, pertaining to dates ranging from April 10, 2023 through April 16, 2023, well within the 14 days designated by TA. On April 27, 2023, the OIG received an email from TA stating that three of the eight requested videos were obtained, three were unavailable, and they were in the process of obtaining the remaining two.

The OIG was also informed that trolley drivers perform daily manual ridership counts, which are compared with TSO Mobile counts, and used when the APC counts are not available. As a result, the OIG emailed TA representatives on April 27, 2023, requesting the March and April 2023 manual ridership counts, but no response was received.

In the interim, the OIG requested and received an Excel spreadsheet from the Transportation and Mobility Department, which was previously provided to the City by the contractor, containing the APC counts and the manual ridership counts for trolleys operating in Miami Beach during March 2023. Consequently, the requested April 2023 video footage and the March through April 2023 daily manual ridership counts were no longer pursued from TA.

The OIG compared the reported APC counts to the manual counts to determine whether each figure would be within +/- 1 of the other 95 times out of 100 (95% confidence level), as claimed in Exhibit B of the TSO Mobile contract. The OIG Auditors' examination of the provided March 2023 Excel spreadsheet found that the APCs for 202 of the 723 line items were blank (27.9%), containing no count whatsoever. This analysis suggests that APCs installed on many trolleys are not functioning and need repair. When TSO identifies that APC devices are not functioning correctly and in need of repair, TSO uses drivers' manual counts for those days until the devices are recalibrated and repaired.

³ https://people-sensing.com/sites/default/files/counter_datasheet_apc-eco_engl.pdf

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The trolleys equipped with the overhead people sensor APCs contained cameras which provide a continuous view of the trolley drivers. The OIG found the reliance on manual counts questionable, ~~as none of the three sampled trolleys equipped with overhead people sensor APCs, showed the driver recording ridership counts during the days examined. Note that the Agreement does not prescribe the manner by which driver manual counts must be completed.~~ Although this is not conclusive evidence that manual counts were not recorded by the trolley drivers, it does raise questions as to the origin and accuracy of the manual count, ~~especially given the high number of blanks in the APC counts.~~

Commented [GJR3]: Not relevant. Accuracy of drivers' counts are irrespective of APC counts.

After eliminating the 202 blanks from analysis, the OIG compared the remaining 521 reported APC counts with the corresponding manual counts. It was determined that only 5 of the 521 line items compared in the Excel spreadsheet (0.96%) were within the +/- 1 benchmark, ~~stated in Exhibit B of the Agreement.~~ The 0.96% correspondence between the APC and manual counts is far less than the stated 95% confidence level ~~listed in the Agreement~~, further supporting the OIG's conclusion that reported ridership counts are unreliable.

Commented [GJR4]: Not sure as to the relevance of this paragraph or what it is trying to convey as Exhibit B does not call for APC counts to be compared to driver counts.

The OIG also compared its video counts from the sampled trolleys, each for one day's operation during the week of March 13 through March 19, 2023, with the manual counts prepared by the trolley drivers (see the table below). In doing so, it was determined that the manual counts were similarly unreliable. It is worth noting that four of the nine sampled trolley days resulted in the manual counts being lower than the OIG video counts (trolley MB08 on March 16, MB18 on March 19, MB28 on March 16, and MB30 on March 15).

Trolley	Date	Route *	Drivers Manual Counts	OIG Video Count	Variance	Variance %
MB08	Thursday, March 16, 2023	South Beach Loop B	604	661	-57	-9.4%
MB08	Monday, March 13, 2023	Collins Express	758	703	55	7.3%
MB08	Saturday, March 18, 2023	Collins Express	768	637	131	17.1%
MB13	Wednesday, March 15, 2023	Collins Express	985	654	331	33.6%
MB15	Thursday, March 16, 2023	North Beach	466	397	69	14.8%
MB18	Sunday, March 19, 2023	Collins Express	700	736	-36	-5.1%
MB28	Thursday, March 16, 2023	South Beach Loop B	364	378	-14	-3.8%
MB30	Wednesday, March 15, 2023	South Beach Loop B	318	420	-102	-32.1%
MB31	Friday, March 17, 2023	South Beach Loop A	380	297	83	21.8%
		Total:	5,343	4,883	460	8.61%

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~~The analysis performed in this report indicates that the City incorrectly relied on the ridership figures submitted by TA in March 2023. The documentation provided showed widespread differences between the manual and APC counts, contrary to Exhibit B of the Agreement, and both differed from the corresponding OIG video counts performed on nine sampled trolley days. The OIG is also concerned that the City may have based some decisions on these inaccurate ridership figures, which may also have been reported to other governmental agencies. Going forward, the Transportation and Mobility Department should periodically conduct its own sample ridership inspections with any deficiencies exceeding a designated percentage promptly addressed with the contractor until being resolved.~~

Commented [GJR5]: However, TSO's monthly exercise of blending both data sources ultimately yields more accurate ridership figures as shown by the results of the two independent OIG tests.

Commented [GJR6]: As noted previously, the trolley service level since inception has been based on initial policy decisions regarding desired frequency of service, service area (i.e. routes), and hours of operation, not on ridership. Ridership has not been a criteria in current or prior service levels nor a factor in terms of payments to LSF. Payments are based solely on number of service hours and contractually established hourly operating rates minus any performance penalties including service interruptions and on-time performance penalties.

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Joseph M. Centorino, Inspector General Date

Mark D. Coolidge, Chief Auditor Date

cc: Alina T. Hudak, City Manager
Rickelle Williams, Assistant City Manager
Jose R. Gonzalez, Transportation Department Director

Appendix A

