



Board Report

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**EXECUTIVE MANAGEMENT COMMITTEE
JULY 18, 2019**

SUBJECT: OFFICE OF THE INSPECTOR GENERAL REPORT, “IS LA METRO READY FOR CLIMATE CHANGE?”

ACTION: RECEIVE AND FILE

RECOMMENDATION

RECEIVE AND FILE Office of the Inspector General Climate Change Report, “Is LA Metro Ready for Climate Change?”

ISSUE

- Determine the anticipated impact of climate change on the transportation industry,
- Determine what actions LA Metro has already initiated to prepare for climate change,
- Benchmark against other transit agencies climate resilient actions,
- Determine what future steps LA Metro might take to prepare for climate change,
- Make recommendations for LA Metro to better prepare for meeting the effects of global warming.

BACKGROUND

The Office of the Inspector General (OIG) conducted a review to determine actions taken by LA Metro to address the impact of climate change on transit and identify best practices. During a board meeting in January 2019, LA Metro’s Board Chair stated: “I don’t think LA Metro is ready for climate change.” This report is to show how LA Metro is preparing for climate change and recommend additional steps LA Metro might take. Our review found that LA Metro has been taking positive steps since 2007 in preparation for climate change; however, we identified additional steps LA Metro can take to ensure the agency continues to deliver safe and reliable public transportation service to customers under future more extreme weather conditions.

DISCUSSION

Climate change is occurring globally with notable effects on the environment. There have been more frequent and erratic weather variations such as extreme high temperatures, strong storms, heavy rainfall, flooding of rivers and the coastline, and sustained drought. Global warming, one symptom of climate change, refers to rising temperatures caused by increased concentrations of GHG in the atmosphere. Climate scientists from 185 countries, with thousands of pages of research, recognize the adverse impact of climate change and have committed to working together to reduce atmospheric CO₂. Erratic rainfall and sea level rise are other symptoms of climate change. Sea level rise is from two factors related to global warming: the added water from melting ice glaciers and the expansion of seawater as it warms. In the last century the California coast line has risen 7 inches and is expected to rise an additional 10 to 18 inches by 2050 because of global warming.

This review was conducted to determine what actions have already been done to prepare for climate change, identify climate resilient options, and determine additional actions needed to address the impacts of anticipated future conditions. To identify industry “best practices,” the OIG researched other transit agencies in our nation, and around the world to determine what is being done to mitigate the impacts of climate change.

National Innovations

The OIG “bench-marked” transit agencies in two hot climate cities and found significant innovations to counter climatic changes for LA Metro’s consideration.

In Las Vegas, Nevada, RTC has multiple indoor chill stations for patrons to wait for the bus out of the heat, water wagons drive the bus routes to hand out complementary water bottles to patrons, and has solar powered shade shelters with LED lighting for their passengers. In the summer, buses run with balloon tires filled with pure nitrogen to improve tire wear and provide a safer transit experience.

In Phoenix, Arizona, Valley Metro has installed an additional air conditioning condenser on the roof of its buses which increases cooling capacity by 60%. They also installed special electric engine cooling fan systems to protect engines from overheating. Their Operations and Maintenance Center is powered by solar energy. They have installed shade canopies on light rail platforms made from fabric that blocks the sun rays. Additionally they have bus shelters with solar powered cool air ventilation system that is push button controlled by passengers. Valley Metro light rail trains employ solar reflective window tint, train bodies painted with solar reflective paint, and two over-sized AC units for redundancy are placed on each light rail vehicles, all of which enhances cooling inside the passenger compartment. Also, the agency partnered with a local refrigeration school to provide custom AC and electrical training programs unique to Valley Metro’s buses and rail cars. Graduate students are then eligible for hire, thus creating community opportunities.

Global Innovations

The cities of Hong Kong, Melbourne, Singapore and London stood out as “benchmarks” for innovation.

In Hong Kong, the Mass Transit Rail (MTR) uses regenerative braking technology to convert kinetic energy produced by the breaking process into electrical energy and puts that power back into the power supply network, with use of a super-capacitor energy storage devices.

In Melbourne, Australia, Metro Trains Melbourne (MTM), monitors real-time rail track temperatures, by installing electronic monitoring sensors in its rail lines, so that control authorities know exactly when actual track temperatures reach 131°F or higher and can immediately restrict speed limits.

In London, Network Rail has installed mini weather-stations and thousands of track-side probes to monitor the local trackside conditions (on above ground tracks). When the weather is hot, Network Rail slows down the trains to mitigate the effects of extreme heat creating track displacements due to rail buckling. Network Rail uses speed restrictions at vulnerable locations.

In Singapore, Land Transport Authority (LTA) has instituted smart bus-stops. These are equipped with the Airbitat Oasis ventilation systems which have several overhead nozzles mounted on the inner roof, and draws from a reservoir of cold water which cools and purifies the air while removing harmful particles. The cool air that is pumped out through the overhead nozzles is more than 90 percent cleaner than the air that surrounds these stations.

Los Angeles County

In California, transportation accounts for nearly 40% of all greenhouse emissions. In 2018, the Governor signed an Executive Order calling for the State to slash its overall emissions to zero by 2045. He also signed Senate Bill 100 stating, “Not only is California going to slash its emission to zero but shall have 100% of total electricity retail sales in California to come from eligible renewable energy resources and zero-carbon resources by 2045.”

LA Metro’s Environmental Compliance and Sustainability Department (ECSD) has put together a series of reports, policy, training, and environmental management systems that complement these state environmental goals. ECSD is proactive in climate change mitigation and adaptation with “key” performance goals of reducing GHG emissions and making the LA Metro system more resilient to extreme weather events and effects of global warming.

The OIG interviewed multiple LA Metro bus and rail operations officials and found:

1. During the peak summer months, buses undergo significantly more maintenance.
2. The LA Metro bus department tested a few electric buses, however the existing design failed to meet the LA Metro’s service requirements.
3. The trolley wire system and the OCS have maintenance issues during very hot periods. High

heat causes the wires to sag and lead to entanglements with the train's pantograph and the contact wire. Newer spring stack technology is available to control sagging wires.

4. The rail tracks need to be continually monitored during sustained hot weather for buckling, cupping, and sun kinks. The current method of walking the track and ordering reduced speed to the train drivers, is the way the track is currently monitored for any track anomalies.
5. Pre-stressing the rail at the temperature in the geographic location prior to installation (for new rail) is the predominate method that LA Metro currently utilizes. Pre-stressing the rail at the projected temperatures for the geographic location based on the latest climate models should be implemented as temperatures are projected to increase dramatically.
6. There are no electronic monitoring track sensors to immediately measure rail temperatures over periods of sustained heat. Deploying the most modern technology of monitoring rail track sensors should be implemented as temperature increase.
7. The ROC currently has no instrumentation to monitor weather and temperature conditions in real time other than the media and one location at Division 20. The ROC could run more efficiently with the ability to have current "real time" weather information. It would be beneficial for efficient train operation to deploy mini weather-stations to monitor the local trackside conditions at strategic key locations based on variability in micro-climates.

LA Metro has initiated many actions to address climate change and work towards achieving the State mandated emission goals. While much has been done, the OIG team found there are other actions that LA Metro could implement using the benchmarks stated in the OIG climate change report, "Is LA Metro Ready for Climate Change?"

The evidence the team discovered found, the system will be impacted when Los Angeles has sustained heat temperatures approaching those of Phoenix, Las Vegas, or Melbourne. The LA Metro System should continue to innovate and update its operations if LA Metro is to achieve the systemic LA Metro goal as stated in the 2019 draft CAAP report of having zero GHG emission by 2050. While much has been done, there remains much to do if LA Metro is to be effectively positioned to meet the demands that climatic changes will put upon this system in the near-term and the future. Metro has the responsibility to conform to California State Laws established by the Governor. Therefore, Metro ECSD should be involved in purchases for new construction of LA Metro transit system and facilities when it pertains to climate change and the warming that will continue to increase.

Our report makes 32 recommendations for LA Metro to consider implementing to prepare for the impacts of climate change. These recommendations are suggested tactical strategies; not dictates or policies. We make these suggestions without regard to cost, which we have not researched and would be dependent on many factors. Metro does not possess unlimited funds. Fiscal responsibility of the public's dollars is an essential guiding principle that we would have to be mindful of in selecting the most appropriately prioritized options.

FINANCIAL IMPACT

The financial impact is undetermined at this time and is dependent on what options Metro chooses to implement to address the impacts of climate change for the agency.

IMPLEMENTATION OF STRATEGIC PLAN GOALS

Recommendations in this report support strategic plan goal #2. The strategic goal states, "Deliver outstanding trip experiences for all users of the transportation system."

NEXT STEPS

Recommendations are provided for multiple departments within LA Metro to consider and implement as they determine. LA Metro departments are asked to provide a written response to the OIG within 90 days.

ATTACHMENTS

Attachment A - Final OIG Climate Change Report

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