



# SMART CITY SOLUTIONS: LOWERING CARBON EMISSIONS AND AIR POLLUTION BY DEPLOYING DRIVERLESS CARS

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10.1" WXGA MULTI TOUCH DISPLAY



BY VIVIEN WANG

**UP** to 70 percent of global consumption-based greenhouse gas emissions come from individual households, according to a recent report made by UNFCCC. Reducing carbon emissions has in recent years become a key initiative in major cities all around the world, from Paris to New York. In the same report, UNFCCC goes on to remark that emission reduction can be achieved by taking measures such as utilizing low carbon transport, and choosing low carbon products and services. In a narrower context, more cities are turning to electric, battery-charged cars or driverless cars as a means of reducing their carbon footprint. Scientific American announced a recent report conducted by the Intelligent Transportation Society of America, which projected that the usage of intelligent transportation systems could facilitate an estimated 2~4 percent reduction in greenhouse gas emissions each year.

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Scientific American also noted that the Smithsonian Institution managed to reduce fuel consumption of their

1,500-vehicle fleet by 53 percent by using intelligent logistics. Business Insider also cites a research study done by McKinsey, which predicts that the use of autonomous cars can reduce up to 300 million tons of CO2 emissions per year – roughly the equivalent of CO2 emissions from the commercial aviation sector.

THE USE OF AUTONOMOUS CARS CAN REDUCE UP TO 300 MILLION TONS OF CO2 EMISSIONS PER YEAR

### CHALLENGES

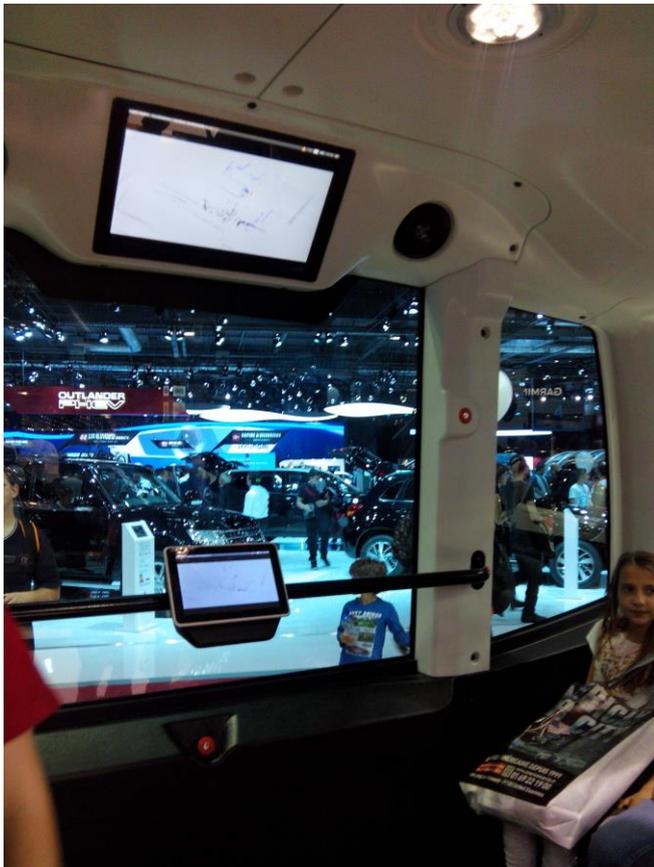
In response to the trend of smart-city carbon emission management, the client wished to deploy a number of electric-based driverless buses in one of the capital cities, which would be able to mitigate the problem of air pollution caused by gasoline-powered cars.



Our client wished to find an easily configurable flat panel display to connect the displays and bus subsystems in an integrated environment. The panel display had to be suitably compact, as space within the bus was limited, and it also had to be shockproof, operating at peak efficiency in vibrating and/or volatile environments. Environmental resiliency against dust corrosion and water was also

required. Additionally, the panel display had to be easily integrated within existing hardware and architecture.

THE ACD-110D IS A LOW RADIATION DEVICE, WITH AN ELECTROMAGNETIC EMISSION RATE OF NEARLY 0%.



AAEON provided the ACD-110D, one in a series of panel PC products. The ACD-110D was 10.1" wide, which exactly fit the client's requirements, and featured a futuristic PADD design with a projective capacitive touch screen, different from most IPC products on the current market. The ACD-110D is an industrial-grade product, and is built for maximum flexibility, resilience and efficiency against outer stimuli and environmental corrosion. AAEON quickly provided test samples for the client to deploy and test.

"WE AIM FOR MINIMAL MIGRATION FROM THE DEVELOPMENT TO THE DEPLOYMENT STAGE."

– ALAN CHOU, PRODUCT MANAGER, SYSTEM PLATFORM DIVISION

#### IMPACT

The client completed a successful 3-month test run with the ACD-110D, during which citizens were able to ride on the driverless buses for free and make use of the display panel firsthand. The ACD-110D offered many configurable parameters for the client to control and manage their systems, allowing maximum interoperability and interface accessibility. The slimly designed yet robust ACD-110D monitor featured a 10.1" touchscreen with multi-touch capabilities, with functions such as pinch-to-zoom. Its compact and slim profile was well suited for driverless buses, as it required minimum space. Complying with the power management regulations of VESA DPMS, the LCD monitor was simultaneously energy efficient and power saving. It was the perfect choice for the graphic-intense driverless bus display as it presented sharper, crisper and flicker-free images. Other features of the ACD-110D included low radiation and an impressive electromagnetic emission rate of nearly 0%. The passengers were able to use the ACD-110D display screen to effectively control the movement of the bus and to tell it when and where to stop.

ENCLOSED IN A CORROSION-RESISTANT YET LIGHTWEIGHT ALUMINUM BEZEL, THE ACD-110D WAS DESIGNED TO BE SIGNIFICANTLY SLIMMER THAN OTHER CONTENDERS IN THE MARKET, MAKING IT A

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The ACD-110D is fully compatible with PCs, while the LCD monitor supports the DDC1/DDC2B-compliant “Plug & Play” feature, enabling easy installation and configuration with pre-existing systems. The On-screen Display menu offers a user-friendly interface that can be easily accessed, so that users can optimize and select the display they wish to use. Its screen offers a resolution of 1280 x 800, providing intricate, fluid and vivid graphics. In addition, the touchscreen is resilient and scratch-proof, and has been reinforced to be dust and water resistant with an IP rating of IP65. Enclosed in a corrosion-resistant yet lightweight aluminum bezel, the ACD-110D has been designed to be significantly slimmer than other contenders in the market, making it a practical yet aesthetically appealing option for applications in confined spaces. The monitor can be either wall mounted or set upright.

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“At the time, it was our first product for the small and slim display market,” said Alan Chou, Product Manager for AAEON’s System Platform Division (SPD). “The ACD-110D greatly lowers cost of development as it has been designed for flexible customization, eliminating the need to purchase multiple displays and seeing what fits. We aim for minimal migration from the development to the deployment stage.”



## REFERENCES

- UNFCCC. (2017). *Helping Citizens Transition to Low Carbon-CAN Network Launched in New York*. [online] Available at: <http://newsroom.unfccc.int/unfccc-newsroom/helping-average-citizens-to-transition-to-low-carbon/> [Accessed 25 Sep. 2017].
- Julia Pyper, C. (2017). *Self-Driving Cars Could Cut Greenhouse Gas Pollution*. [online] Scientific American. Available at: <https://www.scientificamerican.com/article/self-driving-car-s-could-cut-greenhouse-gas-pollution/> [Accessed 25 Sep. 2017].
- Cadie Thompson. (2016). *8 ways self-driving cars will drastically improve our lives*. [online] Business Insider. Available at: <http://www.businessinsider.com/how-driverless-cars-will-change-lives-2016-12/#carbon-emissions-will-be-dramatically-reduced-2> [Accessed 25 Sep. 2017].

## ABOUT AAEON

Established in 1992, AAEON is one of the leading designers and manufacturers of professional intelligent IoT solutions. Committed to innovative engineering, AAEON provides reliable and high quality computing platforms, including industrial motherboards and systems, industrial displays, rugged tablets, embedded controllers, network appliances and related accessories, as well as integrated solutions. AAEON also has the hardware and services for premier OEM/ODMs and system integrators, worldwide. Being an Associate Member of the Intel® Internet of Things Solutions Alliance, AAEON offers customized end-to-end services from the initial product conceptualization and board product development to mass manufacturing and after-sales service programs. Peruse AAEON's expansive line of products and services by visiting [www.aaeon.com](http://www.aaeon.com).