

ENGINES OF

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ENGINES OF GROWTH

IN PRACTICALLY EVERY SINGLE CITY IN THE WORLD, BUSES AND TAXIS REMAIN, TO THIS VERY DAY, THE PREDOMINANT MODES OF PUBLIC TRANSPORTATION. BOTH HAVE BEEN AROUND FOR CENTURIES – AND ARE LIKELY TO CONTINUE TO REMAIN RELEVANT GOING FORWARD, IN SUBSTANCE IF NOT IN FORM.

As a mobility company which was formed through the amalgamation of a taxi business and a bus company, ComfortDelGro has remained true to its roots. With a global fleet of 19,000 taxis and 9,000 buses, we are one of the largest land transport companies in the world. And despite our expansion into new and ancillary business segments, the two main drivers of growth continue to account for over 90% of total group revenue.

According to the Lyon-based ReportLinker, the global taxi and ride hailing industry is expected to hit US\$327.54 billion by 2026, representing a compound annual growth rate (CAGR) of 8.95% over the 2021-2026 period. Likewise, the market research consulting firm, IndustryARC, predicts that the international bus industry will reach US\$55.2 billion by 2026, growing at CAGR of 6.7% from 2021 to 2026.

These are, by any measure, significant markets that show no signs of slowing down. This is why the ComfortDelGro Group continues to pursue growth opportunities in these two key sectors, and invest heavily in new technologies and infrastructure to remain relevant in an increasingly competitive space.

In the next few pages, we will showcase some of the key technology and service improvements that we have made over the last few years as we continue to work at differentiating ourselves from the competition.



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**HOW BUSES
CAME TO BE
A BRIEF HISTORY**

The very first bus hit the streets in Paris in 1662. It was pricey and ran as an exclusive service for members of “high-society” – a total contrast to the situation today. Not surprisingly, it had a very short-lived existence.

Fast forward almost two centuries later and the concept of the modern-day bus service started to take form with the introduction of a “no-reservation” horse-cart service between Manchester and Liverpool in 1824. Started by a toll gatekeeper named John Greenwood, it grew in popularity quickly as passengers were picked up and dropped off anywhere along the way. He soon expanded to other cities and other competitors began offering this exciting new service. Business was so good that the industry eventually consolidated and a new company, the Manchester Carriage Company, was formed.

At around the same time, Stanislas Baudry¹, who lived in Naples, Italy, started a steam-powered flour mill outside the city. Because of the large amounts of hot water produced by steam technology, he decided to make some money on the side by opening a bathhouse. Unfortunately, the bathhouse was a very long walk from central Nantes, so he hit upon the idea of offering a shuttle service – a coach that left from the centre of town on a regular schedule. It held 16 passengers, with eight seated on a bench on each side. Soon, people began taking this

shuttle service not just to the bathhouse. And so, Baudry launched the first urban transit service in 1826. He called his coach an “omnibus,” a Latin word meaning “for all.” He expanded the business to Bordeaux the next year, and then to Lyon. His request to operate in Paris took longer to get approval, as the authorities were cautious about adding large vehicles to the already congested streets, but eventually Baudry and two partners were given permission to operate up to 100 vehicles, each of which could hold a minimum of 12 people and a maximum of 20. The authorities would set the routes. At first, the single fare was 25 centimes (longer routes required double fares and the notion of a free transfer was not developed until 1834), collected by a conductor who was also there to help people on and off through the back door. There were no fixed stops along the route; passengers simply signalled when they wanted to get on or off. The Number 1 route and the most heavily used went between the Place de la Madeleine and the Place de la Bastille by way of the Grand Boulevards.

Over the last two centuries, innovation has completely reshaped the mechanisms and the looks of buses. However, their purpose has remained unchanged: they remain safe, efficient, and comfortable group transportation vehicles.

Horses were slowly replaced by steam engines and electric motors, and eventually by internal combustion engines.

Fast forward to the modern bus. Fast, quiet, luxurious and safe. Entertainment systems, rest room facilities, and high-tech communication technology.



STANISLAS BAUDRY

1 The invention of the omnibus | Pasisian Fields

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AS OUR MAIN PILLAR OF GROWTH, THE BUS BUSINESS ACCOUNTS FOR ABOUT 69% OF THE GROUP'S TOTAL REVENUE, TRANSLATING INTO AN ANNUAL REVENUE OF ABOUT S\$2.59 BILLION. THE LION'S SHARE OF THIS COMES FROM THE SINGAPORE OPERATIONS, WHERE THE GROUP REMAINS THE LARGEST PUBLIC SCHEDULED AND PRIVATE BUS OPERATOR WITH A TOTAL FLEET OF ABOUT 4,000. BUS OPERATIONS IN AUSTRALIA AND THE UNITED KINGDOM (UK) COLLECTIVELY ACCOUNT FOR 56% OF TOTAL BUS REVENUE.

Improvements to bus designs over the past few decades have resulted in significantly higher levels of comfort and reliability that bus commuters have become used to these days. Air-conditioning, low-floor buses, have replaced rickety old buses which were either too hot in the summer or too cold in the winter. Even the boxy look of the old bus exterior has given way to elegant curves and sleek lines. For sure, improvements in design and technology have ushered in a whole new world of bus travel.



INNOVATIONS AND SUSTAINABILITY

Accessibility is one of the key improvements in recent times. Passengers with mobility challenges are now able to get onto buses easily – something that was unheard of a mere two decades ago. This is, of course, significant since it means affordable public transportation options are now readily available to the masses – regardless of physical condition.

As societies began to embrace inclusivity, bus operators started to introduce wheelchair accessible buses (WABs) to their fleets. In Singapore, SBS Transit rolled out its first WAB in 2006, and this was followed by Metroline in the UK a year later. SBS Transit also initiated the introduction of low-floor, zero-step buses to make it easier for those with mobility difficulties such as the elderly to board and alight from the buses safely and more conveniently.

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Concurrently, we also looked at moving up the green ladder. Metroline took an industry-leading role in 2008 in the drive for zero-emission vehicles by investing in hybrid buses which reduced fuel consumption by up to 30% and carbon emissions by 50% compared to the regular diesel-powered buses.

Recognising that electric buses would be a boon for air quality and provide more comfortable journeys through quieter rides, Metroline also worked closely with automotive engineers to build an electric bus. Its efforts resulted in the launch of the world's first double deck electric buses that plied the streets of London in 2016.

Over the next three years, it continued to invest in green buses which contributed to London having the biggest fleet of electric vehicles in Europe.

Meanwhile, SBS Transit and ComfortDelGro Corporation Australia (CDC) were kept busy in conducting test trials and

operating eco-friendly buses. SBS Transit's green fleet is currently made up of 31 fully electric buses and 25 hybrid ones while CDC, which has an electric bus and the biggest fleet of 50 hybrid buses in Australia, is committed to adding another nine more hybrid buses and eight electric ones in the next few years.

Unwavering in its commitment towards zero-emissions, Metroline made history in 2021 when it unveiled London's first 20 double deck buses powered by hydrogen. These buses marked a turning point for the public bus industry as they produce no pollution from their exhausts and take a mere fraction of the time to be fully refilled – under 10 minutes compared to six hours for electric buses.

Today, in a span of 15 years, Metroline's fleet of green vehicles has grown and now includes over 700 hybrid buses, close to 100 electric buses, and 20 hydrogen buses.

**UNWAVERING IN ITS COMMITMENT
TOWARDS ZERO-EMISSIONS, METROLINE
MADE HISTORY IN 2021 WHEN IT
UNVEILED LONDON'S FIRST 20 DOUBLE
DECK BUSES POWERED BY HYDROGEN.**





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HARNESSING TECHNOLOGY FOR SAFETY

It was not just improvements and innovations in the bus designs that revolutionised the public bus industry. Technology paved the way forward in lending a big hand, not least of all in helping our drivers keep and be safe on the road. This is essential as a hygiene factor in promoting the use of public transportation. Significant investments have been made in various systems across our public bus operations globally.

One such system is Mobileye which started as a trial on 30 buses in 2014. It aids SBS Transit bus drivers by serving as an extra pair of eyes to alert them to potential risks that may come into their paths. This advanced driver assistance system features an intelligent camera sensor which is mounted at the front of the bus and alert drivers through a dashboard display unit when they are too close to the vehicle in front, and if a pedestrian or cyclist comes into their path. Warnings are given to the driver in the form of visual and audio alerts through a small dashboard unit.

Mobileye is now installed in all SBS Transit's and CDC's buses to reduce the incidence of accidents.

Telematics systems have also found their way into the buses of Metrolink, CDC and SBS Transit to record and monitor individual drivers' driving behaviour such as speeding, cornering and harsh acceleration. Significantly, feedback is given to the drivers in real-time through audio and visual alerts so that corrective actions can be taken immediately. Drivers also use the scores to track their own progress, while managers use them for coaching. Passengers benefit ultimately as drivers work hard to improve their driving competency.

When it comes to driver fatigue, CDC in New South Wales has implemented the Guardian Alert System which employs complex algorithms and artificial intelligence to monitor driver's facial expressions, eyes and head movements to determine fatigue and distraction. Acting as a sentinel, it emits audio alerts while a vibration is transmitted to the bus driver's seat to rouse the driver into action. SBS Transit has also installed a similar system on a trial basis.



MAKING TRAVEL BETTER

Technology has also enabled us to take bigger strides to be more effective in our operations and management.

Way back in late-2006, SBS Transit pioneered the Automatic Vehicle Management System (AVMS) at a cost of S\$40 million to enable automatic vehicle location monitoring and communication between buses and the Operations Control Centres (OCCs). With it, the OCCs were able to "tell" where the traffic jams were and how to redirect buses so that bunching could be minimised. It also enabled each and every incident and breakdown that occurred to be reported – making it easier for Management to zoom in on problem areas. It also had the capability to track down the exact location of the buses while they were on the move and the OCCs could communicate immediately with the driver instead of having him stop the bus to make a call using a handphone. This resulted in the faster deployment of road assistance.

A distinct benefit of AVMS to passengers laid in its capability to provide bus arrival information in real-time

through an intelligent route information system known as "iris". Iris provided information on when the next two buses will arrive at the specified bus stop.

With the availability of up-to-date information on the bus arrival timings, it forever changed the way passengers travelled – by putting them in control of their journeys.

Introduced for the first time in Singapore in early-2007, passengers could request for information on the NextBus Arrival Timings of their bus services through the website and subsequently via the Short Message Service on their handphones. This meant no more long, anxious moments of waiting aimlessly and wondering when the bus will arrive.

Bus and train advertisements have also evolved over the decades. From wholly painted designs to three-dimensional ones, advertisements have also gone digital with Light Emitting Diode screens spread across huge wall spaces to offer visual treats for passengers in their commute.

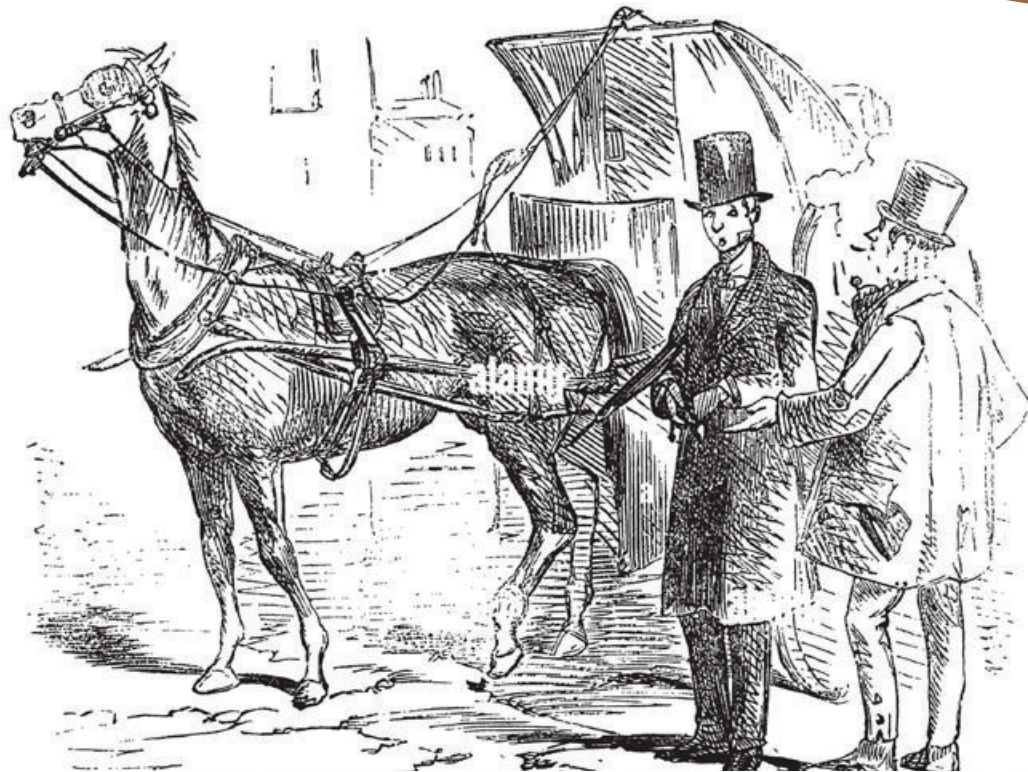




THE FUTURE OF THE BUS BUSINESS

Beyond bus designs and technology, the framework in which public buses operate has also evolved. Governments are increasingly implementing a bus contracting model where the Government retains the fare revenue and owns all infrastructure and operating assets such as buses and depots. Bus operators are contracted and paid to operate public bus services through a competitive tendering process. It is a more sustainable way of public bus operation since the risk of fare revenue and the heavy investments are shouldered by the regulators, thereby relieving bus operators of this burden. Operators are then able to focus their full attention on the provision of safe, reliable and comfortable commuting.

Much has changed in the last 20 years. Looking ahead, there is no doubt that even more significant changes can be expected in the next 20. Greener vehicles will come on as technology improvements are made. Countries and companies are now talking net zero. Autonomous vehicles are also being talked about. Without a doubt, the wheels of change will continue to spin and we remain committed in setting the bar for the industry. Our end goal is to better serve our passengers and the communities we operate in.



THE WORLD'S FIRST TAXIS

A BRIEF HISTORY

The origin of the internationally used word 'taxi', which, if you think about it, means the same thing in practically every language in the world today, is from the ancient Greek word *τάξις* (taxis), which means 'payment'².

A taxi, also known as a taxicab or simply a cab, is a type of vehicle for hire with a driver, used by a single passenger or small group of passengers, often for a non-shared ride. A taxicab conveys passengers between locations of their choice. This differs from public transport where the pick-up and drop-off locations are decided by the service provider, not by the customers.

There are four distinct forms of taxicab, which can be identified by slightly differing terms in different countries:

HACKNEY CARRIAGES

Hackney carriages, also known as public hire, hailed or street taxis, licensed for hailing throughout communities

PRIVATE-HIRE VEHICLES

Private-hire vehicles, also known as minicabs or private-hire taxis, licensed for pre-booking only

TAXIBUSES

Taxibuses, also come in many variations throughout the developing countries as jitneys or jeepney, operating on pre-set routes typified by multiple stops and multiple independent passengers

LIMOUSINES

Limousines, specialised vehicle licensed for operation by pre-booking

Although types of vehicles and methods of regulation, hiring, despatching, and negotiating payment differ significantly from country to country, many common characteristics exist.

² Taxi: origin of the word and history of the modern day taxi | Staxi

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A Case Study

THE COMFORTDELGRO TAXI STORY

FROM A CALL TO A CLICK

AS ONE OF OUR MAIN PILLARS OF GROWTH, THE TAXI AND PRIVATE-HIRE BUSINESS ACCOUNTS FOR ABOUT 13% OF THE GROUP'S TOTAL REVENUE, TRANSLATING INTO AN ANNUAL REVENUE OF ABOUT S\$473 MILLION. THE LION'S SHARE OF THIS COMES FROM THE SINGAPORE OPERATIONS, WHERE THE GROUP REMAINS THE LARGEST TAXI OPERATOR WITH A FLEET OF ABOUT 9,000. TAXI AND PRIVATE-HIRE OPERATIONS IN CHINA, THE UNITED KINGDOM AND AUSTRALIA COLLECTIVELY ACCOUNT FOR 27% OF TOTAL TAXI REVENUE.

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THIS ALL CHANGED IN 1971 WHEN COMFORT TAXI WAS FORMED. THE OBJECTIVE WAS CLEAR: PROVIDE A STRUCTURED, ORGANISED AND TRANSPARENT SYSTEM FOR CABBIES AND PASSENGERS ALIKE.



HUMBLE BEGINNINGS

In the 70s and 80s, anyone wanting a cab in Singapore (and most parts of the world for that matter) had to stand at the side of the road or queue at taxi stands to flag one down.

In the early 90s, taxis were just a phone call away.

Today, they are just a tap away.

Technological advances have introduced waves of change in the ever-evolving Point-to-Point (P2P) transport sector. These days, passengers are able to get a ride through multiple ways if they do not wish to flag for one along the streets. These include dialing for one, using the Short Message Service or SMS, and now tapping on their smartphones.

In the very early days of the taxi scene in Singapore, "pirate" taxis ruled the day. There were no rules and no proper fare structures in place. Cabbies were unlicensed and those who did not own a vehicle of their own had to rent one at very exorbitant rates. To cover the high cost of rental, drivers would pack their cars with as many passengers as they could at any one time – and in the process, flouted many safety regulations.

It was a recipe for disaster.

This all changed in 1971 when Comfort Taxi was formed. The objective was clear: Provide a structured, organised and transparent system for cabbies and passengers alike. Licensed taxi companies like Comfort had to comply with clear government guidelines including those related to driver and safety compliance.

Set against that stable environment, the taxi industry grew from strength to strength. Driver training became a key focus, vehicles moved from manual to automatic drive and air-conditioning was introduced.

In 1996, Comfort broke new ground by launching CabLink – a S\$35 million satellite-based despatch system which completely changed the way taxis operated in Singapore. Taxis were directed to where they were needed most and empty cruising was reduced. Cabbies were able to get more jobs instead of driving around aimlessly, whilst reducing their fuel spend.


With 8,000 taxis in the fleet managed by this state-of-the-art system, Comfort became the world's largest satellite-linked taxi firm – a major feat for an operator in one of the world's smallest countries.

In 2005, the Integrated Taxi Management System, a General Packet Radio Services-based (GPRS) taxi booking and despatch system, was launched – further improving the way taxi bookings were managed.





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The system, which worked on technologies such as GPRS, Global Positioning System, Text-to-Speech, voice streaming and intelligent algorithms, shaved waiting time for passengers and resulted in an increase in booking jobs and higher income for cabbies. Cashless payment also became a new norm on board taxis.

The arrival of the iPhone in 2007 forever changed the way the taxi industry operated.

Mobile applications or “apps” made taxis even more accessible to commuters who no longer needed to pick up the phone, make a phone call, speak to an operator and wait for a booking to be confirmed. Technology cut short this entire process to just a click of a button or two.

The ComfortDelGro Taxi Booking App was launched in February 2010 and in just 10 months, clocked one million app bookings. In fact, for two years running in 2014 and 2015, the ComfortDelGro Taxi Booking App was so popular that it was named the Favourite Taxi App at the Travellers’ Choice Awards by TripAdvisor.

Today, the app garners an estimated 33 million bookings a year.

This number is expected to grow over the next few years with the formation of the Private Mobility Group (PMG) which brings together ComfortDelGro’s taxi, private bus, car rental and leasing and lifestyle businesses under a new umbrella division. The re-organisation aims to synergise and leverage on the Group’s core strengths in land transport solutions, whilst making it easier for customers to gain access to the various services across the various businesses.

On 19 April 2022, its all-in-one CDG Zig App was launched in place of the ComfortDelGro Taxi Booking App to give customers access to the full range of mobility and lifestyle offerings that ComfortDelGro has to offer via a unified digital platform. With the CDG Zig App, booking a ride, charging an electric vehicle and making restaurant reservations are but a few taps away.

MOBILE APPLICATIONS OR “APPS” MADE TAXIS EVEN MORE ACCESSIBLE TO COMMUTERS WHO NO LONGER NEEDED TO PICK UP THE PHONE, MAKE A PHONE CALL, SPEAK TO AN OPERATOR AND WAIT FOR A BOOKING TO BE CONFIRMED. TECHNOLOGY CUT SHORT THIS ENTIRE PROCESS TO JUST A CLICK OF A BUTTON OR TWO.

THE FUTURE OF MOBILITY



From street hail to App bookings, ComfortDelGro Taxi has indeed moved with the times and incorporated multiple technologies in its operations over the years.

Technological advances introduced convenience and efficiency for both passengers and cabbies. As Singapore progresses into a car-lite nation, introducing green modes of transport and sustainable practices are the way forward.

Supporting the Singapore Green Plan 2030, ComfortDelGro Taxi aims to up its green quotient by rolling out 1,000 electric taxis by 2024.

With the Group investing S\$30 million to set up the Autonomous Vehicle Centre of Excellence, aimed at building up its capabilities in the operation and maintenance of such vehicles. Who knows? Self-driving robotaxis may just be an additional option ComfortDelGro Taxi has to offer for passengers in years to come.

HOW T SINGAPORE H



**TOYOTA
CROWN**

**HYUNDAI
SONATA**

**HYUNDAI
I40**

AXIS IN AVE EVOLVED



**TOYOTA
PRIUS**

**HYUNDAI
IONIQ**

**HYUNDAI
KONA**

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