

New York City UniCabs



One cab for everyone

A unique social enterprise initiative of the
Universal Design Co & New York Access Center



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Concept and strategy

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OVERVIEW

Challenges and opportunities

This paper introduces Universal Design Co and outlines its summation of the challenges and opportunities facing New York City in its quest to introduce an iconic taxi cab.

It details issues connected to the:

- Choice of vehicle,
- Competing manufacturing processes
- Shortcomings with currently available vehicles,
- Time constraints,
- Patrons,
- Global trends.



THE CONSULTANT

Our people

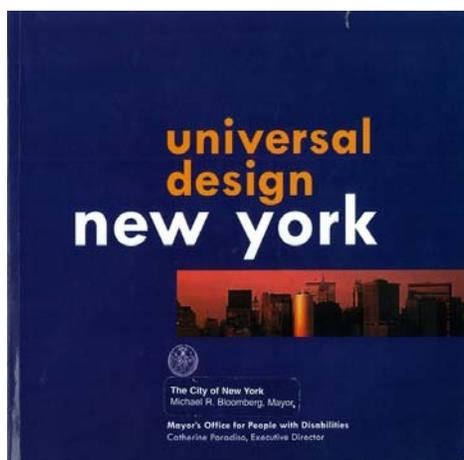
The Universal Design Company (UniCo) is an associate of UniCab Australia (UniCab), whose first dealings with the Mayor's Office for People with Disabilities was in July 2002, the year that *Universal Design New York* was published.

UniCab was incorporated in May 2000 to develop universal taxi services that focus on the mobility impaired.

It is a pioneering advisor to the New South Wales and other Australian state governments on social enterprise funding for charities and non-profit organizations. Its focus is on universal design taxi cabs (UniCabs) and cost-effective initiatives to integrate public transport so that more people are moved in less time with reduced congestion, pollution and cost.

UniCo's founder, Chris Burrell, is a member of the Australian Chartered Institute of Logistics and Transport and a member of the Society of Automobile Engineers International.

Mr Burrell will have primary responsibility to perform and/or supervise and co-ordinate the performance of the services.



The company's managing director, Jacob F Baldwin, is an accredited trainer and assessor of wheelchair-accessible taxi drivers. Mr Baldwin was a foundation member of the Disability Council of NSW, which brought the first wheelchair-accessible taxi to Australia in 1980. He is also a presenter of national and international acclaim in the area of disability-related studies.

UniCab and UniCo are free from commitments to particular vehicles and outdated network technologies.

They recognise the public as partners, not just as customers, and are excited with New York's opportunity for a quantum leap in public passenger transport.

Over the past few years, UniCo has been investigating the suitability for the Australian market of minivans by Chrysler, Honda, Toyota and Kia.

More recently, UniCo has been looking at ways to improve the economics of creating universal design taxi cabs by combining the production lines of original equipment manufacturers and 2nd stage modifications.

UniCo has long-standing relationships with leading US 2nd stage manufacturers and had dealings with the Australian division of DaimlerChrysler.

UniCo's consulting engineer is Gest Engineering and Consulting Inc, which is located in Fountain Hills, Arizona and has been in existence for three years.

The primary areas of business are providing engineering design services to automotive and mobility related customers. It also



provides expert forensic engineering testimony to a variety of defense and plaintiffs.

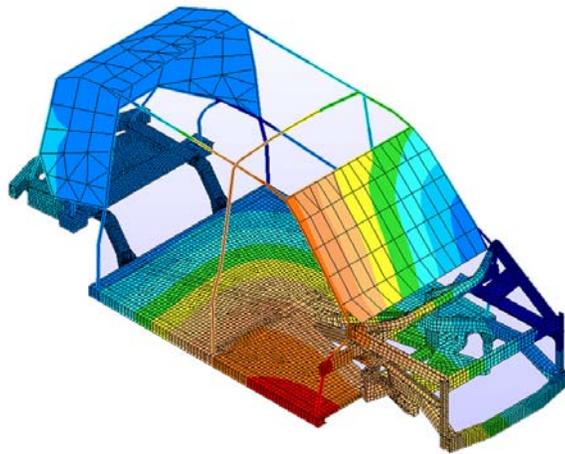
William E. Gest, the founder and president of the firm, has many years of automotive and mobility engineering experience. He started his career at General Motors as a co-op student attending General Motors Institute. Early in his career, he worked in the manufacturing portion of business and

SOCIAL ENTERPRISE

Sustainable income for non-profits

This submission is made by UniCo as an initiative of the New York Access Centre, which has been formed as a nexus of city and state non-profit organizations that will share a sustainable, recurring and renewable income stream from a royalty.

The royalty will be based on the gross income created from automobile manufacturing and related businesses.



THE DILEMMA

Theory v practise

The central choice facing any city wanting to introduce a taxi cab capable of meeting the demands of a wide variety of stakeholders is whether to develop a prototype of a purpose-built taxi cab or modify an existing vehicle.

In theory, prototypes offer the chance to create the perfect taxi cab.

However, purpose-built taxi cabs have been barely able to get off the drawing board. The problem is gaining finance to get the project to a commercial scale.

These vehicles are solely for the taxi market but require similar capital outlays as those needed to develop vehicles for a global consumer market.

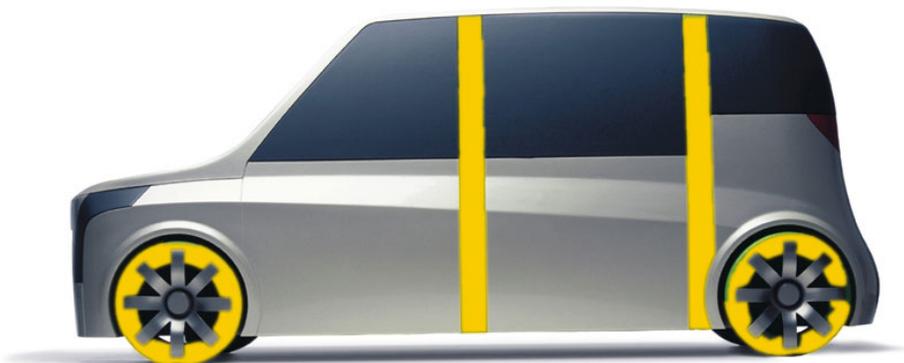
In short, tooling up is expensive. Prototypes need the economies of scale available to existing vehicle manufacturers.

Unfortunately, manufacturers – and cultures – prefer to develop their own designs.

What is required is a global search without fear or favor to obtain the highest standard in taxi cabs.

The vehicle should be in keeping with New York's standing as the capital of the world and provide an opportunity for the city to demonstrate world's best practise in:

- Driver safety, enhanced



communications, and usability.

- In-car telematics, tourist and traveling guest infotainment & safety.
- Innovative ground transport logistics and integration initiatives.
- Enhanced 24/7, door-to-door demand-response transport capabilities.

The vehicle will also help New York City increase its share of the trillions of dollars spent globally each year on disability travel by becoming the destination of choice for more and more cashed-up baby boomers.



POSSIBLE VEHICLES

Prototypes

A number of prototypes of purpose-built taxi cabs have been produced but they have generated mixed interest.

One is Sweden's City Cab. It is a fantastic vehicle and packed with many features but start-up manufacturers have major economic obstacles. The capital investment in tooling up is too great for the relatively small market. On the other hand, existing manufacturers want to build their own designs.

Another purpose-built cab is the Standard Taxi from Chicago, which was banking on a minimum take-up from fellow taxi industry players plus government incentives to make its economics feasible. However, it has simply been unable to get enough commitments from interested buyers.

A third example of a purpose-built taxi cab is the Metroking. It, like the other two, is struggling to generate sufficient market

interest to get far beyond the drawing board.

In all three cases, an ideal has been created. All that's missing is a commitment that would create sufficient demand to underpin them.



2nd stage manufacturing

Many existing vehicle manufacturers produce vehicles that can be modified to provide universal design transport. These include Chrysler, Ford, GM, Honda, Kia, Nissan and Toyota.

Associated 2nd stage manufacturers have up until now primarily provided modifications to make these minivans wheelchair accessible for the private market.

Other 2nd stage manufactures modify vehicles other than minivans so extensively that the results are seen as purpose built taxi cabs.

So modifications can go further than simply changing a vehicle to suit new users. They can create the iconic rolling public spaces that New York City wants from its taxi cabs.

Bringing together an original equipment manufacturer and a 2nd stage manufacturer on one production line will prove more cost effective while also cutting down on lead times – even with an iconic design.



FEATURES OF THE VEHICLE

Short and long-term improvements

As a minimum, the improvements offered by the new vehicle should include:

- Wheelchair accessibility.
- Hybrid fuel capability.
- Partition with passenger services.
- Roof light with improved readability.
- Integral child seats.
- Skylight.
- Greener interior-compartment materials.
- On-board air filters.
- Improved interior compartments and overall proportions.

However, UniCo believes that whichever model and manufacturer is chosen, the vehicle should also have:

- A floor that is lowered to enhance driver line of sight and provide generous headroom.
- Plenty of interior room to allow for maximum wheelchair manoeuvrability.
- Safe side entry rather than the more common rear entry.
- Powered in-floor ramp with non-skid surface for unrestricted entry and exit.
- A system to automatically and gently lower the vehicle to decrease ramp incline and increase accessibility.
- A low ramp angle to provide almost effortless entry.



- A short ramp length to allow for parking in tight places.
- Full crash testing.

The vehicles should also be designed to accommodate technology to enable:

- Cashless payment.
- Mobile-phone hail.
- Integration of Yellow Cab and radio fleets.
- Congestion pricing.



SHORTCOMINGS OF CURRENT VEHICLES

Risk and stigma

Many vehicles servicing disabled passengers have rear entry and exit.

These vehicles are not prestige vehicles, nor do they provide disabled passengers in wheelchairs with the benefits enjoyed by non-disabled passengers.

Alarming, they can be riskier. Wheelchair users are often placed in the dangerous position of having to pass between traffic and parked cars. Rear entry and exit increases the risk of rear-end collision.

As well, taxis with rear entry and exit increase the distance from passenger to driver and make communication difficult, and create a rougher ride by placing the passenger near or over the rear axle. Rear-entry vehicles also create the feeling that the wheelchair-bound passenger is on display and stigmatise them as handicapped rather than preserving their dignity.

Side entry and exit allows wheelchair users to sit near the driver, be in the middle of the vehicle, and enjoy a conventional seating position.



PRODUCTION

A choice

Ideally, the vehicle will be built in the US irrespective of whether it is a purpose-built taxi cab or has iconic 2nd stage modifications.

If a purpose-built taxi cab is preferred, it would be built with generally accepted methodologies.

If 2nd stage manufacturing is preferred, both the vehicle and the drop-floor side-entry conversion kit would be shipped to an assembly plant in parts.

At the plant, both kits would be assembled on a production line under the supervision of workers trained by both the manufacturer and the 2nd stage manufacturer.

A hybrid engine will also be fitted into the vehicle at this time.

The assembly would be unique as nowhere else is the after-manufacturing brought forward to be accomplished at the time of assembly on the original equipment manufacturer's production line.

In contrast, 2nd stage manufacturers usually take complete

vehicles from manufacturers and strip them back to the bare cabin. The floor is then cut out before the specially made drop floor is welded in and the vehicle resprayed and reassembled.

The unused capacity of an operational or recoverable plant in the US could be ideal. Alternatively, a plant in China or India may prove more suitable.



PATRONS

Mobility difficulties of seniors

The number of over 65s is expected to grow four to five times faster than the wider community in the next 25 years until they make up a quarter of the population. That's more than double their current 12%.

The aged and the disabled will grow to 45% of the population over the next 25 years.

UniCo sees the mobility difficulties of seniors and the disabled as an opportunity for the New York City taxi fleet to provide roomy, comfortable transport when used by non-disabled people.

Many baby-boomers who suffer restricted mobility are looking for vehicles they can get in and out of easily.

So using universal design vehicles to cater for both the disabled and the non-disabled gives taxi operators the chance to cater to two markets with one vehicle.



DEADLINES

All-hybrid fleet

The introduction of the new taxi cab will have to be aligned with the mayor's spring announcement that by 2012, all taxis will be required to get at least 30 mpg - compared with the Crown Vic's 14.

It will also have to keep pace with the milestones to an all hybrid-fleet. These milestones are:

- Oct 2008 – 1,000 yellow hybrid taxicabs
- Oct 2009 – 4,000 yellow hybrid taxicabs (30% of the fleet)
- Oct 2010 – 7,000 yellow hybrid taxicabs (53% of the fleet)
- Oct 2011 – 10,000 yellow hybrid taxicabs (76% of the fleet)
- Oct 2012 - all yellow taxicabs will be hybrid (100% of the fleet)



LEGAL COMPLIANCE

Wheelchair regulations

New York's new iconic wheelchair accessible taxi cab will have to comply with a number of federal and local regulations. These will include:

- The Americans With Disabilities Act
- Department of Transportation regulations
- Federal Architectural & Transportation Barriers Compliance Board regulations



NEW MARKET SEGMENTS

Solving the over-supply

It could be argued that outside peak times and wet weather conditions there is an over-supply of inaccessible taxi cabs.

However, in such circumstances wheelchair accessibility and/or universal taxi design become part of the solution to over-supply rather than part of the problem.

Wheelchair-accessible / universal taxis can access segments of the whole market that are currently closed to inaccessible taxis.



GLOBAL TRENDS

Anti-discrimination and pro-seniors policies

Developed countries around the world are experiencing a rise in their disabled and elderly populations and are legislating to provide equal transport for the mobility-impaired, the elderly and the general public.

England and Ireland have already legislated to provide universal-design cabs to ensure an equal service for everyone.

In Australia, the Human Rights and Equal Opportunity Commission and the Disability Council of NSW have recommended similar laws. They also support universal design as the solution for parity of service.

Other countries in the OECD and the UN have similar aims.

Helping to support the anti-discrimination laws are laws to encourage competition. These initiatives are slowly breaking down barriers to entry for new players against powerful taxi industry lobby groups that are resistant to change.



Another important factor affecting global automobile manufacturing is the increased concern about climate change among car buyers. This has increased the popularity of cars able to run on alternative fuels and most commentators expect this trend to continue.

Other vehicles

China: The makers of the black London Cab, which was forced by legislation to become wheelchair accessible, have just announced a \$230m joint venture with a Chinese car maker to produce 20,000 vehicles a year in Shanghai. They are also trying to establish themselves in the US.

Japan: Japan is concerned that the rapidly growing number of aged people may destabilise its economy more than other OECD countries. So its government asked all their car makers to design the WelCab, a prototype car suitable for their mobility impaired seniors.



DRAFT WORK PLAN

Task 1: Concept development and review

- Determine overall vehicle definition and needs
- Obtain approval of these specifications from customer
- Survey the worldwide automotive industry for potential vehicles
- Develop list of information needed on each vehicle

Task 2: Development of vehicle technical specifications

- Detail specification developed for each vehicle system
- Obtain customer approval for specifications
- Develop evaluation system for evaluating each vehicle

Task 3: Evaluate vehicles

- Obtain from vehicles information required for evaluation against detailed vehicle specifications.
- Visit manufacturers of the top five vehicles meeting specifications
- Finalized information

Task 4: Manufacturing options

- Perform trade-off studies to determine if second stage



conversion or on-line production is most cost effective with the top five vehicles

- Determine if pre-delivery modifications are required

Task 5: Design process

- Prepare overall packaging drawings for selected vehicle.
- Drawings to be suitable for soliciting bids from suppliers.
- Complete written specifications
- Review drawings and specifications against governmental regulations
- Obtain agency approvals

Task 6: Final package

- Revised and update specifications as required by customer.
- Final presentation to customer

Notes:

- Drawings that will be made are for packaging and not for making detailed parts.
- Meetings with customers would be conducted as required throughout the project.
- Tolls such as “Go to Meets” would also be used to minimize travel costs for all parties.



CONCLUSION

The time is right

New York's move to replace its ageing, fuel-thirsty Ford Crown Victorias with an iconic green taxi cab offers it the chance to make a statement on the global stage.

The time is right to capitalize on advances in universal vehicle design, hybrid engines, and communications technology to create a quantum leap in the quality of public passenger transport.

And Unico, with its understanding of universal design and relationships in the North American market for wheelchair accessible vehicles, makes it the ideal choice to liaise between the New York City Economic Development Corporation and the motor vehicle industry.

It promises to faithfully assess all possible options fairly using accepted trade analysis methodology to get the best result for the people of New York City.

