Getting around the challenges of getting around

While most of us take our personal mobility for granted, or even greatly appreciate it, there are many who are not able to walk to their vehicle, much less enjoy the freedom of getting in and going places. Some are elderly or ill; others have suffered life-changing injury; all seek to maintain an active lifestyle. Fundamental hand controls have been available for man years, so someone without full use of their feet can perform basic acceleration and braking procedures. Racks are available to carry a wheelchair on the back of a larger vehicle. And specialized vans have been able to accommodate a passenger, and sometimes a driver, in a chair. Now, breakthrough developments by the major manufacturers are allowing the disabled unprecedented ability to access, enter, exit, stash their gear, and drive or ride in comfort and total control. A combination of newly specialized vehicles, plus standard vehicles with broader forethought applied, present an enormous leap in mobility and in personal freedom.

Ford Mobility Motoring

Approximately 13,000 people with disabilities received benefits from Ford through November 2003. Since its creation in 1992, the Ford Mobility Motoring program has assisted more than 100,000 people with millions in reimbursement funds.

In addition to financial aid, Ford Mobility Motoring can provide a state-specific information packet listing assessment centers, equipment installers and other potential sources of financial assistance, including extended vehicle financing terms through Ford Credit Mobility Financing. Ford is the only automotive manufacturer to be honored by the National Business and Disability Council and two-time recipient of the National Business and Disability Council's Valued Customer Award in 1998 and 2002 for its mobility efforts and practices. For more information call 800.952.2248 or log on to www.mobilitymotoringprogram.com.

Mobility Tuned Focus— The Ford Mobility "Tuned" Focus puts young people with disabilities into the driver's seat of the "hot-hatch" craze inside the world's best-selling car. At the Chicago Auto Show, Ford displayed a customized Focus ZX3 demonstrating mobility enhancements that can make vehicles accessible yet still exciting to people with disabilities. Ford worked with aftermarket appeal manufacturer Ballistic Unlimited and Bruno Independent Living Aids to create the "Tuned" Focus with street racer appeal and features.

The basic Ford Focus claims more headroom and easier ingress and egress than other cars in its class. Instrument panel controls, including larger radio and climate control knobs and buttons, are designed to be easier to locate, grab and manipulate. Building from this solid base, Bruno Independent Living Aids of

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Oconomowoc, Wisconsin, worked to make the car even more accessible. Bruno's Low-Profile seats in both driver and passenger positions provide an even more ergonomic seating position and power-rotate on Bruno Power Turnouts™, allowing the seat to rotate 90 degrees and including a sensor to stop operation if there is an obstruction encountered during rotation.

Rotary, hand-operated Wells-Engberg driving controls were integrated to the left of the steering column for independent, simultaneous one-hand control of both throttle and brake. Bruno has also installed a trunk lift in the rear hatch opening, which easily stores Bruno's versatile Typhoon™ C3 Scooter in the rear. The scooter has been painted to match the car's exterior, and the seat has been styled to match the interior. The interior features color-keyed upholstery to match the exterior colors.

The Mobility "Tuned" Focus has power and performance to match its edgy looks. The engine has Toucan Industries performance air intake, ignition wires and a Bosal stainless "cat-back" exhaust. Braking and cornering are enhanced by a lowered Intrax suspension, reactive upper strut, 17-by-7-inch wheels, Power Stop rotors and 225/50R-17 tires. Ballistic Unlimited added cool art style to the exterior. The ZX3 has been painted Infra-Red with Modern Image Graphics Corporation's sliver and carbon flames outlined in black. The body kit comes from Wings West Avenger and has prototype Muth Signal Mirrors, as well as Body Pros tinted headlamps and taillamps.


The Go Mobility Ford Expedition concept vehicle.

Go Mobility Expedition Concept

The Project Go Mobility Eddie Bauer Expedition is a technically advanced mobility-adapted SUV concept vehicle. An incredibly thorough complement of exterior, interior, mobility and off-road features include these highlights:

- A positional backup camera aid for enhanced visibility while in reverse
- Ride-Rite® IntelliRide air springs with three levels for lowered position for easier ingress and egress, optimal performance on the street and 2-inch increase in ride height for off-road
- Microwave-based technology with both audible and visual indicators when the vehicle approaches an object in front
- Wireless tire pressure and temperature information for each wheel and tire assembly, with audible and visual alarm when a change is detected.
- Thermostatically controlled wiper blades, automatically heated at temperatures below 35°F
- Reconfigurable digital instrument cluster
- Bluetooth™ hands-free access to PDA, cell phone and other devices, as well as links to other vehicle systems
- Hands-free voice controls for the entertainment system, heating, cooling and next-gen telematics
- Easy transfer from the passenger seat to the driver's seat
- Wheelchair docking center with Polytech net between the rear seats for safe, secure storage of a wheelchair
- Power rear liftgate activated by voice, key fob or manually
- Bruno seating with hand-controlled pivoting and articulating passenger seat base that matches the interior (this seat can be installed in other Ford, Lincoln and Mercury full size SUVs, pickups and full-size vans)
- Bruno rear tailgate lift to raise, lower and rotate a fully assembled mobility device from curbside or directly behind
- Wells-Engberg CT-100 Rotary Hand Operated Driving Controls
- On-board remote fill station for inflating tires and other pneumatics
- WARN® 9.5ti Thermometric Winch with a pulling capacity of 9500 pounds
- KC™ fog and driving lights
- Optima® Yellow Top Deep Cycle Batteries allows for greater cranking capabilities at high current loads.

Mercury Monterey Mobility Minivan

Lincoln-Mercury and Bruno Independent Living Aids have teamed up to debut the 2004 Monterey mobility minivan, Mercury's first long wheelbase minivan with adaptive mobility equipment.

Unveiled at the Greater LA Auto Show, the van features front- and second-row Bruno Turny™ passenger seats that rotate 90 degrees, plus power out and down, allowing a person to sit in either seat before entering. Both seats are operated by individual hand-held controls and have a weight capacity of up to 330 pounds. Unlike most seats modified with accessibility functions, Monterey maintains the original factory front passenger seat. Both seats can be easily restored back to original condition for resale.

The rear of the Monterey houses a new, fully adjustable Bruno Offset Fold-Away™ powered scooter lift capable of raising and storing a scooter or wheelchair weighing up to 200 pounds. The lift can load a fully-assembled scooter easily in three positions: curbside, from behind, or from the driver's side.


A bit more conventional than the activity-based Focus and Expedition projects, the Mercury Monterey Mobility Minivan offers extremely thorough and flexible mobility modifications.

Bruno's Rio Travel Scooter™ is stowed in the well behind the third-row seat and does not interfere with Monterey's seven-passenger capacity. The adaptive mobility equipment featured on Monterey is available through an authorized Bruno dealer after the purchase or lease of any Ford, Lincoln or Mercury vehicle.

The Monterey has been engineered specifically to address the physical limitations of people. Particular attention was placed on ergonomic engineering early in the product development process to allow a full-term pregnant woman, the elderly or other people with physical limitations to perform everyday vehicle functions with minimal or no restrictions.

Ford Mobility Motoring— According to Census 2000, there are nearly 50 million people in the U.S. with a long-lasting physical disability. More than 20 million Americans have a walking disability. The US government considers a person to have a disability if he or she has difficulty performing one or more activities of daily living (walking, seeing, hearing, speaking, lifting/carrying or grasping small objects). More than two million are wheelchair users and 400,000 people drive an adaptive vehicle. Approximately 70 percent of the disabled community is currently of driving age. The Ford Mobility Motoring program offers people with physical disabilities comprehensive roadside and financial assistance of up to $1,000 for the installation of adaptive equipment on new Ford, Lincoln and Mercury vehicle purchases or leases. The program also reimburses up to $200 on alerting devices for hearing impairments, lumbar seats and running boards.

FEDA— Ford Employees Dealing disAbilities (FEDA) is a Ford employee resource group, representing an important two-way benefit to employees and the company. FEDA members include employees with and without disabilities. They have the benefit of peer and management support on workplace issues through networking forums and educational events. The group serves as a valuable resource to the company in helping to best understand the needs and preferences of customers with disabilities. They provide support, identify barriers, provide information and contribute to employee development.

Third-Age Suit— In 1999, Ford developed the Third-Age Suit as a hands-on research tool. The full body Third Age Suit, appearing as technical as a space suit, ages the wearer by 30 years, using materials that add bulk and restrict movement in key areas of the body such as the knees, elbows, stomach and back. Together with gloves that reduce the sense of touch and goggles that simulate cataracts, the suit gives engineers and designers a realistic feel for the vehicle needs of the elderly.

Research gathered from the suit was helpful in the design process of these Ford Mobility vehicles. ■

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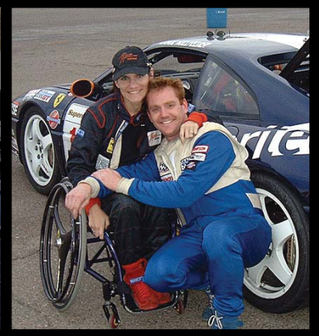
"No Boundaries"—

Tiger Racing, HP Motorsport and Ford Motor Company bring Carol Hollfelder to the SCCA Speed World Challenge GT Championship

Tiger Racing of Covina, California, first developed their technical relationship with Ford Motor Company in support of their 2003 Speed World Challenge effort. Tiger Racing campaigned a Ford Mustang for driver Carol Hollfelder, a paraplegic, who uses specially engineered hand controls to race competitively at the professional level. Ford Motor Company supplied Cobra 4.6 DOHC engines and Tremec six-speed electrohydraulic gearboxes to the team. This transmission employs fingertip control Formula 1 style paddles that enable almost imperceptible gear changes to be completed in under 250 milliseconds - less than the blink of an eye. Ford also provided technical support for the program.



The Tiger Racing Mustang GT, as shown at the SEMA show in Las Vegas, and on the track. Driver Carol Hollfelder and crew chief Paul Brown appear before their run at a NASA race in Phoenix. The "No Boundaries" race cockpit is totally purpose-built and totally accessible.

HP Motorsport of Omaha, Nebraska, constructed the Mustang for Tiger Racing and provided trackside engineering and support under the direction of Paul Brown, a veteran now in his tenth year of the World Challenge Series, and general manager for HP Motorsport. The Mustang is equipped with HPM's spec wing, SLA front suspension, Bassani Xhaust, Brembo brakes and Vortech superchargers.

Hand controls— To win races, any race car must be operated at its performance limits. The driver must have precise control of steering, braking, acceleration and gear selection. Furthermore, this control must be applied in a chaotic environment of g-forces, speed, proximity to other racers and changing track conditions. An able-bodied racer uses both hands and feet to control the vehicle. A paraplegic racer is unable to use her lower body, so those functions normally controlled by the feet must be accommodated elsewhere. In the Hollfelder/Therkleson Hand Control System, the race car is controlled as follows:

Function	Able Bodied Racer	Hollfelder/Therkleson System
Steering	Hands	Hands
Throttle	Right Foot	Finger Tips
Brake	Right Leg Extension	Arm Extension
Clutch	Left Leg Extension	Thumb Switches
Gear selection	Right Hand	Thumb Switches

The Mustang— The Tiger Racing Mustang GT is based on the 2003 Ford Mustang. It is, however, a purpose built road racing car with a number of significant design features that make it unlike any other Mustang. The paddle shift gear box clutch system, developed especially for this car by Ford's Advanced Powertrain Division, allows high speed shifting with two simple thumb switches on the steering wheel. Brake and throttle controls by Tiger Racing are also on the steering wheel, as is the radio push-to-talk button. The motor is a special all-alloy 4-valve 4.6 L V8, supercharged and intercooled in joint development by Ford and Vortech Superchargers. Huge disc brakes and fully independent suspension at all four corners handle impressive Fikse 18" x 9.5" front and 18" x 12" rear wheels. The Mustang generates 500 hp at 6800 rpm, and 450 lb/ft torque at 6000 rpm. Total weight of 3000 lb. includes the driver.

"Ford has an extensive history of applying racing technology to their road cars," says Hollfelder, "and we believe our development of adaptive devices will support Ford's 'No Boundaries' campaign. We are excited to have a powerful race car with Ford's legendary reliability and customer commitment."

Tiger Racing debuted the car at the SEMA show in Las Vegas and performed a full World Challenge campaign in 2003 with sponsorship from Ameritec, a telecommunications test equipment manufacturing company. ■

GM Mobility—

Universal design for all populations

The GM Mobility Reimbursement Program was launched by General Motors in 1991 at GM dealers nationwide, reimbursing up to $1,000 toward the cost of adaptive mobility equipment permanently installed in a new GM vehicle. Building on the success of this program, GM launched the Mobility Center in October 1999. From engineering to marketing, the GM Mobility Center includes employees with disabilities such as severe arthritis, deafness and spinal cord injuries to help make key decisions.

Many seniors and people with disabilities can benefit from some form of adaptive equipment. GM Mobility engineers consider all adaptive equipment options when addressing the needs of seniors, people with disabilities and primary caregivers who deal with difficult entry, exit and driving tasks. Whether it's an additional assist grip or a rotating and extending seat, there are many solutions available to ease the effects of arthritis, stroke, MS, spinal injuries, and other disabling conditions.

A tiered approach divides mobility projects into three main groups.

TIER 1: ENHANCEMENTS TO BASE VEHICLE: This includes features and attributes that benefit all customers, with a focus on seniors and people with disabilities. This tier incorporates Universal Design techniques in the base vehicle design, such as door swing angle (wider opening doors), outside door handle, inside door release, assist grips and control knobs.

TIER 2: MOBILITY REGULAR PRODUCTION ACCESSORIES (RPA): This includes development of vehicle Regular Production Accessories (RPA) that benefit seniors and people with disabilities, but are transparent to those without mobility issues, such as additional assist grips, seat bottom over

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rocker to improve entry/exit, 12-volt power to accommodate mobility, in-trunk/rear tie-down systems, mobility equipment hoists and pivot/extend seat base.

TIER 3: MOBILITY REGULAR PRODUCTION OPTIONS (RPO): The third tier focuses on Regular Production Options (RPO) that benefit customers and upfitters who structurally modify GM vehicles that meet a very specific need for people with disabilities. These options remove cost and make the vehicle easier to be modified by the upfitter. Vehicles are designed to allow wheelchair/scooter users to remain in their mobility equipment while entering/exiting, driving or being a passenger, such as RPOs that delete carpet and second-row seats (available for both minivans and full-size vans), or add a longer wiring harness to feed the rear of the vehicle (minivan lowered-floor application only).

GM Mobility Craftsman Program The GM Mobility Craftsman program forms formal relationships with upfitters who alter GM vehicles for people with disabilities. GM offers two regular production options (RPO) for both minivan and full-size vans, Y3G (personal use) and Y3H (commercial/paratransit use). These RPO codes lower the cost of the vehicle by eliminating unwanted equipment. For minivans, the Y3G and Y3H RPO codes eliminate the carpeting and underlayment as well as second-row seating, and furnish an extended-length wiring harness for a lowered-floor, side-entry, wheelchair-accessible van. For full-size vans, the Y3G and Y3H RPO codes eliminate carpet and underlayment and right front/second-row seating. Vehicles with the mobility RPO codes are shipped directly to the Mobility Craftsman dealer the customer selects.

Affinity Group Provides Guidance The GM Affinity Group educates, informs and creates awareness among employees, customers and the general public about GM's commitment to employ, accommodate and market to seniors and people with disabilities. The group has been the primary force behind the establishment of GM Mobility Reimbursement, the GM Mobility Center and joint UAW-GM Paragon programs. In addition, it has provided help to GM in a number of areas such as awareness training, vehicle accessibility, building-access and emergency-evacuation protocol, vehicle donation programs, live and open captioning, and review of brochure and auto show information.

Financial Assistance GM offers special financing from GMAC for up to 72 months on all vans, and reimbursement of up to $1,000 toward the cost of mobility adaptive equipment. For full details, call: 800-323-9935. TTY (Text Telephone) users: 800-833-9935

GM's Mobility Center Through research and input from focus groups consisting of senior drivers and people with disabilities, the GM Mobility team has provided valuable insight on features and packages that help accommodate many with special needs. "Through the Mobility Center and the GM Mobility program, GM is striving to build a stronger relationship

between engineering, manufacturing and sales as it pertains to senior drivers and people with disabilities," said Talbot.

GM and iCan Partner General Motors and iCan, a leading Internet-based community for people with disabilities, have partnered to develop a web-based automotive channel specifically geared to address the needs of people with disabilities. The online channel, part of the iCan web site (www.ican.com), provides information on vehicles with an emphasis on how they fit, or can be adapted to meet, the needs of consumers with disabilities or special needs. The site also provides forums for people with disabilities to share automotive-related information and opinions, and provides GM with feedback from customers with special needs.

OnStar System Offers Security With GM's available OnStar system, help can be found at the touch of a button. Advisors can contact emergency services or roadside assistance.—24 hours a day, seven days a week. OnStar combines sophisticated global positioning with wireless technologies to deliver personal service. OnStar customers can have a medical history available in the event of an emergency. The customer fills out a form with pertinent medical information, such as medications, allergies, previous surgeries, insurance, physician and emergency contacts. Information is kept confidential. OnStar is available for most GM cars and trucks.

GM and the UAW Join Forces In 1995, GM formed its Paragon Team to better understand the needs of people with disabilities. That focus has gone even further, looking at the needs of a growing senior population, people with arthritis and others. In January 2001, GM and the UAW joined forces and expanded the Paragon Team to include represented active and retired employees. Data collected will be used to develop Paragon Team vehicle requirements.

GM and the Mobility Center seek to provide universal design solutions to accommodate all populations. "Our priority is to design vehicles that will allow as many people as possible to maintain their independence, either as a driver, passenger or with aid of a caregiver," said Gary Talbot, manager of mobility engineering for General Motors. ■

Minivans are GM's Flagship for Mobility

For the more than 54 million people with disabilities and 76 million seniors in the U.S., functionality and flexibility are critical factors when considering what vehicle to drive. When GM designed its latest series of minivans, those elements were paid close attention by the design engineers.

Examining the needs of both seniors and people with disabilities allowed GM to develop a van that could accommodate the needs of more people. GM minivans provide more functionality than any other in the industry. "In looking at the needs of seniors and people with disabilities, we were able to provide universal design solutions that apply to a larger segment of the population," Talbot said.

GM minivans provide many flexible features which contribute to vehicle functionality and ease of use, including:

- Universal design door handles and door pulls are easier for everyone to use
- Larger front-row door openings provide more space for entry/exit
- Widest sliding-door opening in the industry provides easier access to third-row seating and accommodates 30"-wide ramp/lift required by ADA with no modifications to the door opening
- Assist grips allow for easier entry and exit
- Locking steering column/wheel assists in entry/exit
- Higher seat cushion to ground height enables easier entry/exit
- Available run flat tires
- Large rear hatch area provides additional space for stowing equipment
- Power sliding doors on passenger and driver side are very beneficial for loading and unloading
- Second-row captain's chair can be modified with a Turny seat base to assist in entry/exit for a person with limited flexibility or a disability
- Flat load floor provides easy equipment stowage
- Large outside rearview mirrors provide large rearward field of vision
- OnStar is available—you're never driving alone!

Other features such as all-wheel drive with Versatrak, fully independent rear suspension and available steering controls add to the functionality of GM's mobility flagship.