Look Ma, No Hands…

A Look at High Tech Driving and Vocational Rehabilitation

By: Jenny Nordine, OTR/L, CDRS & Jill Sclease, CTRS, CDRS

Driving To Independence

Abstract

- This course is designed to provide an overview of the Vocational Rehabilitation (VR) process as it relates to High Tech driving. Advancements in technology are providing more opportunities for independent driving. This course will allow the generalist to identify the potential for someone with a disability to have the opportunity to be assessed for the potential of being a safe and independent driver. Such independence can and will allow clients the opportunity to work, have increased social lives and to participate in leisure activities of interest. This course will also demonstrate the collaboration between VR, the client, the Certified Driver Rehabilitation Specialist (CDRS) and the mobility vendor.

Key Learning Outcomes

- The participant will identify three types of adaptive driving equipment for independent and safe driving.
- Participants will explore common vehicle modifications needed for wheelchair users.
- Following this presentation, attendees will be familiar with the extensive process of a high tech adaptive driving assessment.
- Attendees will have a basic knowledge of the MVD medical review process.

Presenters:

- Jenny Nordine, OTR/L, CDRS
- Jill Sclease, CTRS, CDRS

Who is going to "Teach Me to Drive?"

- CDRS – Certified Driving Rehabilitation Specialist

- Therapist specializing in adaptive driving

Types of Evaluations

- Comprehensive Driving Evaluation
- Potential To Drive
- Senior Safety Evaluation

Adaptive Driving Assessment

- Clinic Assessment
- Behind the Wheel Assessment
- Evaluation/Training Vehicle

Areas to Consider for Return to Driving

Cognitive

Physical

Areas to Consider for Return to Driving

- Cognition
  - Speed of Decision Making
    - 4 way stop intersection
  - Judgment of Time and Space
    - Turn in to the flow of traffic
  - Distractibility
  - Problem Solving
    - Road Construction
  - Mental Endurance
    - Driving for extended periods
    - Driving home following many errands
  - Topographical Orientation
    - Locate familiar/unfamiliar locations
  - Divided Attention
    - Preparing for a turn, bicyclist, traffic slowing in lane
  - Anger Management
  - Level of Frustration Tolerance

Areas to Consider for Return to Driving

- Visual Perceptual skills
  - Speed of Processing
    - Information is being presented at 65 mph
  - Figure Ground
    - Identify important information in visual clutter
  - Visual Memory
    - Recall latest speed limit sign
  - Visual Closure
    - Identify a stop sign when partially covered with tree branches
- Visual acuity
  - MVD Standards
- Visual neglect
  - Left Neglect
    - Turns onto surface streets

Areas to Consider for Return to Driving

- Right Sided Weakness
  - Steering with one hand
  - Vehicle ignition
  - Operate gear shift
  - Use of original pedals
  - Use of climate control
- Left Sided Weakness
  - Steering with one hand
  - Operate turn signal

Areas to Consider for Return to Driving

- Bilateral lower extremity weakness
  - Use of hand controls
    - Right side hand controls
    - Left side hand controls
- Decreased/Impaired Sensation
  - Ability to move foot between pedals accurately
  - Appropriate amount of pressure applied to pedals

Will I Ever Be Able to Drive?

- Adaptive Techniques
- Training
- Therapy
- Adaptive Equipment
- Time

Arizona Driving Requirements

- In order to be licensed to drive in the state of Arizona, the Arizona Motor Vehicle Department requires the driver be able to **independently** enter the vehicle, stow their equipment, drive, recover their equipment and exit the vehicle.

Arizona Motor Vehicle Department Vision Requirements

- 20/40 in one eye - no restrictions
- 20/50 – in at least one eye - daytime only
- 20/60 in both eyes – daytime only

- Peripheral vision 30 degrees nasal and 75 degrees temporal

Bioptic Telescope Lens System

Figure 1 Bioptic glasses

Vehicle Access – Transfer Assist

- **Entry assists**
- **Slide board**
- **Seatbelt extensions/assists**

Slide board

Passive seatbelt

DIOR by Q straint

Transfers from outside vehicle

Fold down elevating seat board
Adapt Solutions XL Seat

Access Unlimited Glide "N" Go

Other transfers from outside vehicle

Bruno valet-signature-seating-valet-plus

Adapt Solution – Link
Driver and Passenger side

Transfers inside the vehicle

MPD power transfer seat base

B & D power seat base

A power transfer seat base allows the vehicle driver seat to have increased travel – allowing a client easier transfers into the OEM seat to drive.
Usually 6 way power: up/down, forward/back, and rotates

Wheelchair transport options – Sedan

Vehicle-lift-take-apart-lifts

Back saver by Bruno

Car Topper by Braun

Chariot by Bruno

Wheelchair and scooter storage – Van

Adapt Solutions Speedy Lift

Bruno VSL 900

Platform type

Crane lift type

Other Wheelchair transport options

Bruno lift for pickup

Scoota trailer (also available with metal cover)

Modified Mini Vans

Fold out ramp

Slide out ramp

Fold out ramp video:
http://www.youtube.com/watch?feature=player_embedded&v=-B4f0SCaPP8

Slide out video
http://www.youtube.com/watch?feature=player_embedded&v=mkDxPnd-Txs

Modified Full size Vans

Braun UVL
With lowered floor and raised roof/doors

Braun Millennium

Ricon Slide-away

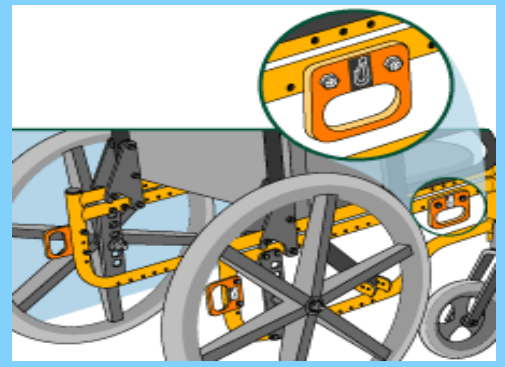
Ricon Klearvue

Ram Promaster

Wheelchair Securement

Manual tie downs
Ratchet style manual tie downs with adjustable seat belts (Sure-Lok)

Retractor type manual straps
(note integrated seat belt) Sure-Lok



Example of hook symbol

Automatic docking systems

Freedom Sciences Dock 'N' Lock

EZ lock

Q'Straint also produces a docking device: QLK-150

New securement devices - recently introduced

Radock no - pin docking system http://www.radocksystems.com/

http://www.lokkup.com/Products/Lokkup.aspx

Primary controls - Steering Orthotics

Spinner knob

Palm spinner

Single post

V- Grip

Tri – Pin

Amputee hook grip

Quad Fork Spinner

Primary controls - **Steering modifications - distance**

Column extensions @ the wheel

Entire column extension

Steering wheel extension

Primary controls - **Steering modifications - effort**

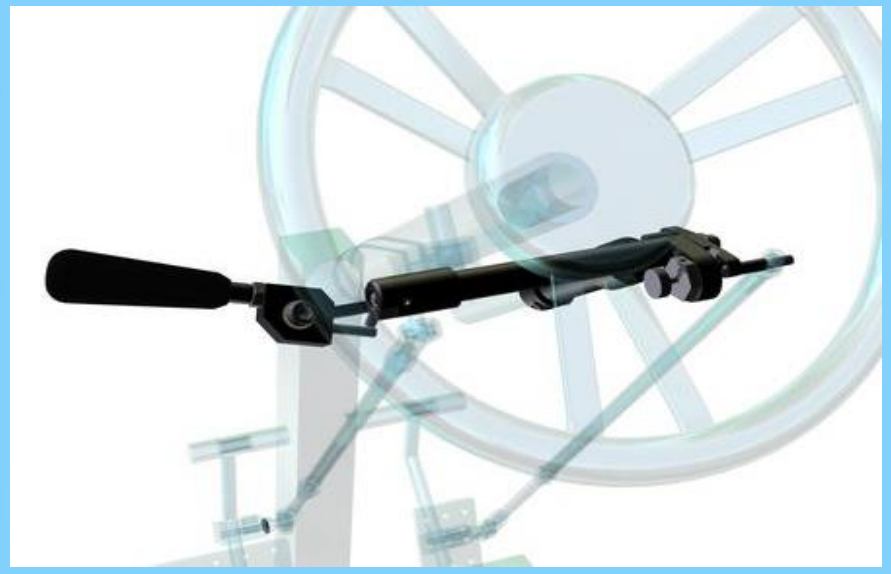
Reduced/Zero effort steering

- Standard factory power steering requires approximately 40 ounces of effort to operate. Steering modifications can reduce the required effort to 20-24 ounces (low effort) or 6-8 ounces (zero effort). (These statistics will vary depending on model of car and tire size)
- These systems will also require a back up safety system, should there be a malfunction.

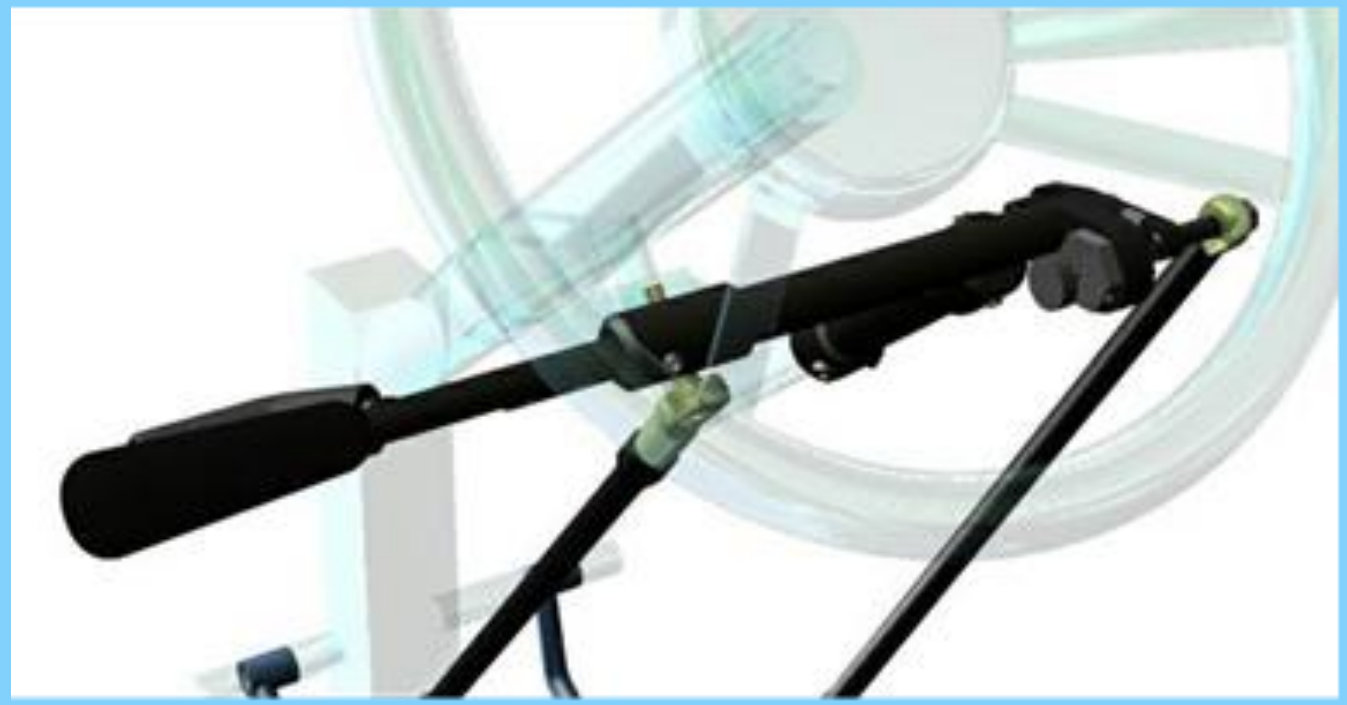
Primary controls – **Gas/Brake column mounted**

Push right angle

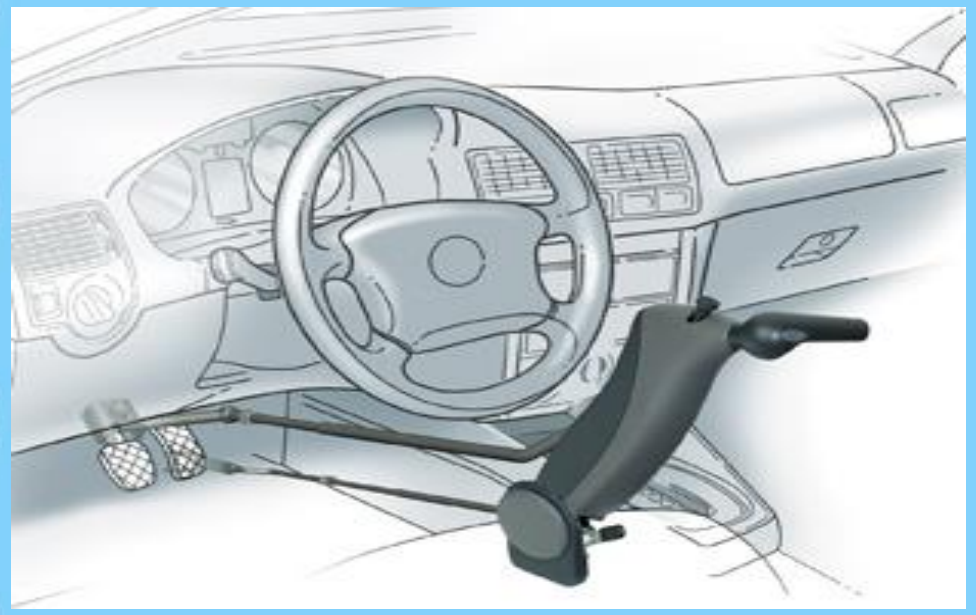
Push pull



Push Twist



Floor Mounted Right side hand controls

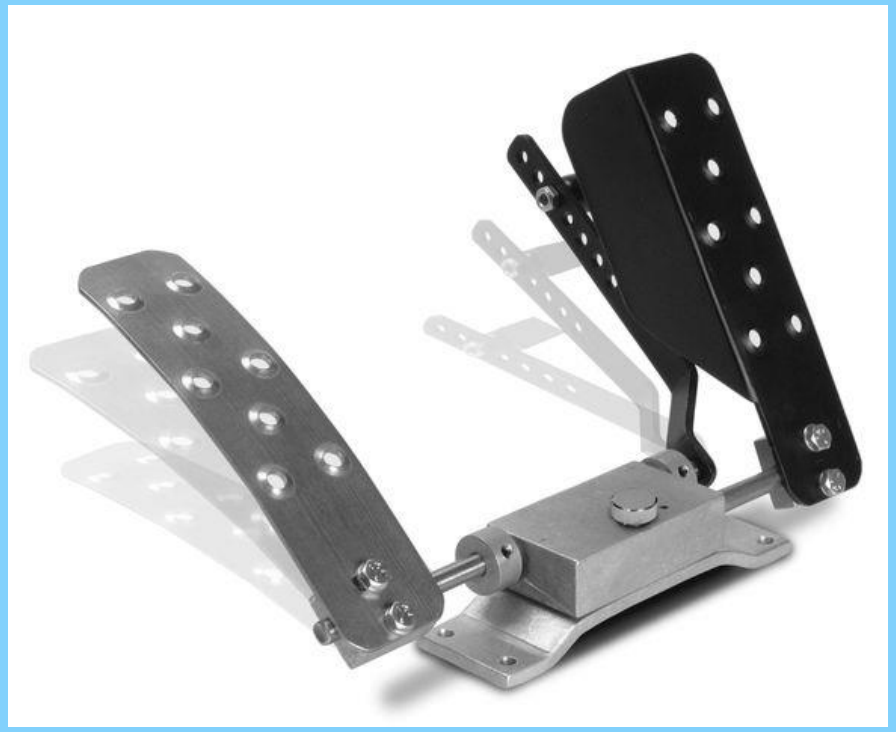


Veigel North American

AutoAdapt Menox

Pedal blocks/guards

Left foot accelerator



Pedal extensions

Secondary controls

Gear shift extension

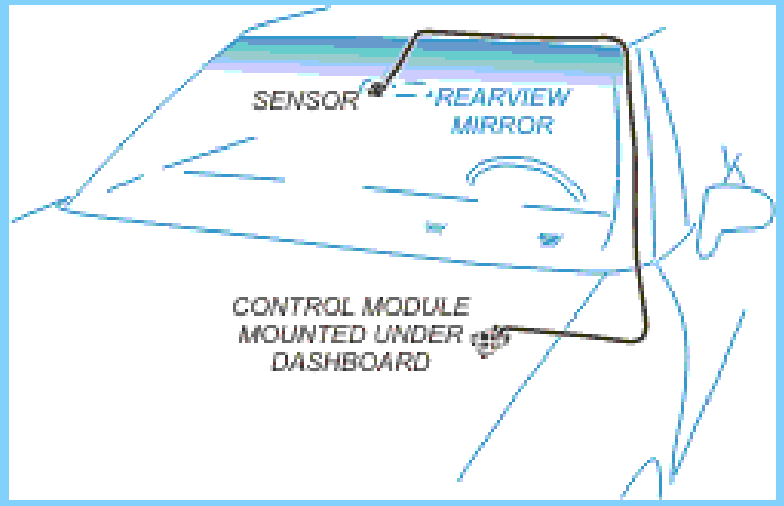
Turn signal crossover

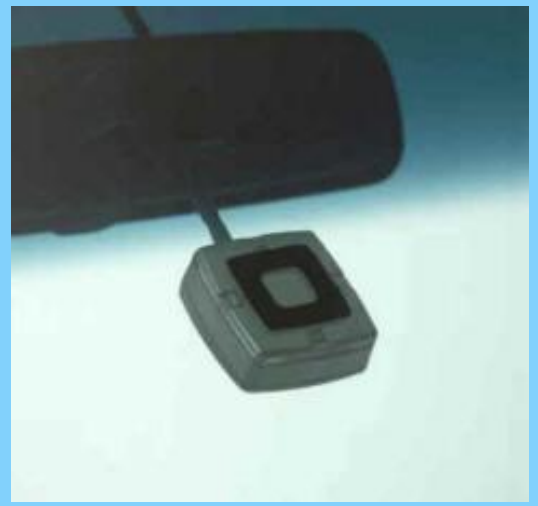
Drop down turn signal lever

Dash mounted gear shift lever

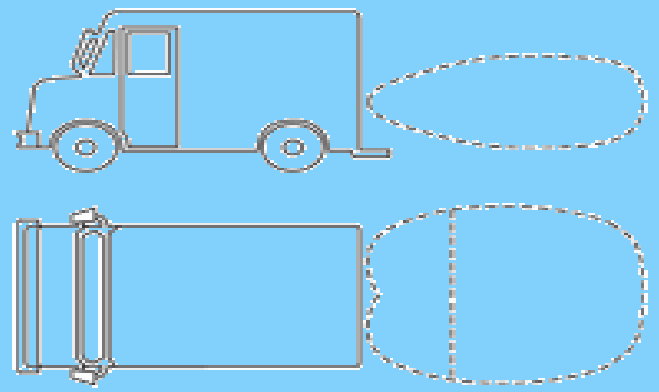
Key turner

Rain sensing windshield wipers





Rear hazard detection



Echovision

Back up camera with monitor

Mirrors

Autobahn mirror

smart view mirror

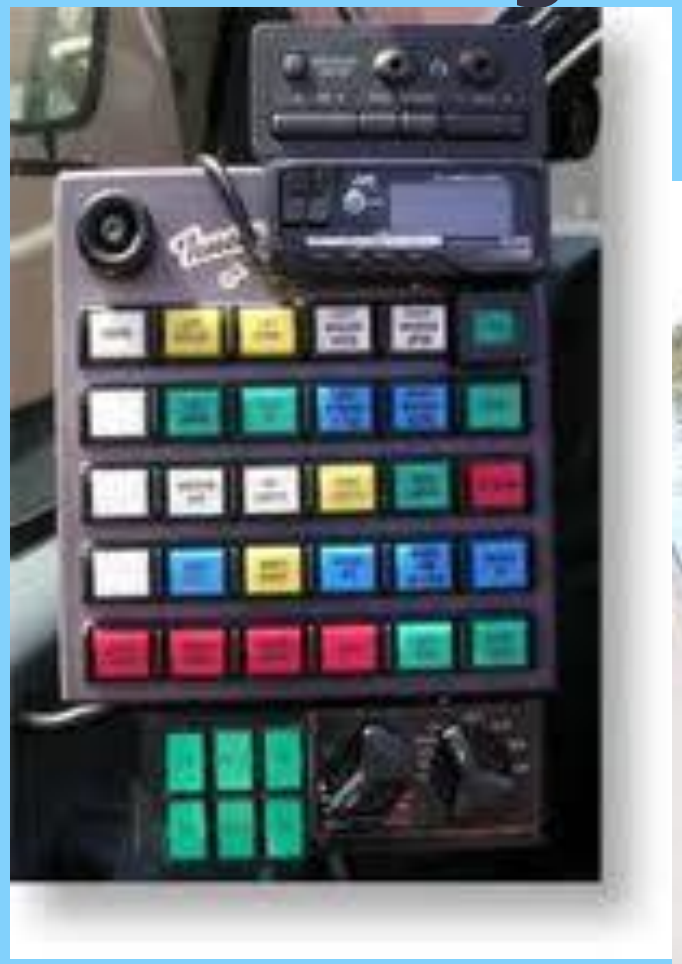
Lanechanger

Postural support/Torso belts

High Tech driving options:

- DSI – Driving Systems Incorporated (also referred to as the Scott System)
  - Located in Van Nuys, CA
- AEVIT – EMC
  - Located in Augusta, ME

DSI – Driving System Incorporated



DSI con’t

EMC Primary Control options

Primary Control Options

Select from one or more of the following input devices to configure your AEVIT 2.0™ Driving Control System. Each device has a communication port on the bottom which can connect up to three remote switches used to trigger secondary vehicle functions. This makes it very handy when configuring the vehicle for individual needs! The type of input device(s) selected determines the name of system. For example, a steering (W) input device along with a lever (L) input device makes the system a WL-Series. The following is a brief description of all of the input devices currently available:

LEVER (L) - A gas/brake input with 4" of travel and requiring 4 lbs of force from the full gas to the full brake position. It is designed for customers that have a wider range of motion and a larger effort level.

JOYSTICK (J or SJ) - A joystick input that is available in a two-axis configuration for gas/brake and steering or a single axis for gas/brake or steering. It has a total range of motion of 60° and requires a maximum 3.2 oz of force to operate. It is designed for customers with a minimal range of motion and effort level.

WHEEL (W) - A steering input that has a 2:1 turn ratio between the AEVIT wheel and the vehicle's steering wheel. It requires 3.2 oz of force at the proper orthotic position of 3 3/8" from center. It is also designed for customers that have a wider range of motion.

EMC Driving Orthotics

EMC Driving Equipment and headrests

Joystick

DIGI-PIN-SWITCH

Joystick Pin Switch

Pin
(included with all Joysticks)

Round Knob
(included with all Joysticks)

Oval Knob
(included with all Joysticks)

Power Headrest

Designed for the wheelchair driver that requires assistance with upper body support and secondary switch activation.

PWRHR

Power Headrest (no switches)

PWRHR-1

Power Headrest w/1 button

PWRHR-6

Power Headrest w/ 6 buttons

4

EMC secondary control options

Secondary Control Options

The following options are sold only in conjunction with a primary control system:
See page 5 for stand alone secondary systems.

OPTION A - Our most popular option contains almost every function that would be required in a modified vehicle! Look at what you get!

- Ignition
- Starting
- Lights
- Turn Signals/Hazards
- Horn/Dimmer
- Wipers
- Cruise On/Set
- Shift (P,R,N,D,D2)
- Windows
- Locks
- Electric Park Brake

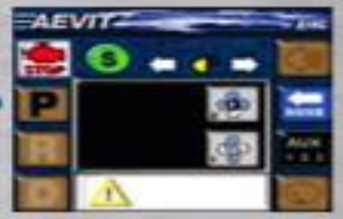
Plus...

- (4) Programmable Auxiliary Functions
- Customer Screens

OR

- Left and Right Power Mirror Control
- (1) Auxiliary Function
- Customer Screens

AND



- Front & Rear Fans

OR

With Optional HVAC Servo

- Front & Rear Fans
- Vent Selection
- Temperature

Other options

OPTION B - With this option you get most of the standard secondary functions including:

AND

- Ignition
- Starting
- Lights
- Turn Signals/Hazards
- Horn/Dimmer
- Wipers
- Cruise On/Set
- Electric Park Brake
- (1) Programmable Auxiliary Function
- Customer Screens

OPTION C With this option you get a small number of secondary functions including:

AND

- Turn Signals/Hazards
- Horn/Dimmer
- Wipers
- Cruise On/Set
- Electric Park Brake
- (1) Programmable Auxiliary Function
- Customer Screens

Adaptive Techniques

- Steering
- Braking
- Accelerating
- Steering and Braking and Accelerating

Adaptive Techniques

- Turn Signal Use
- Speed Control
- Check Blind Spot on BOTH Sides of Vehicle
- Yield or Accept Right of Way

Adaptive Techniques

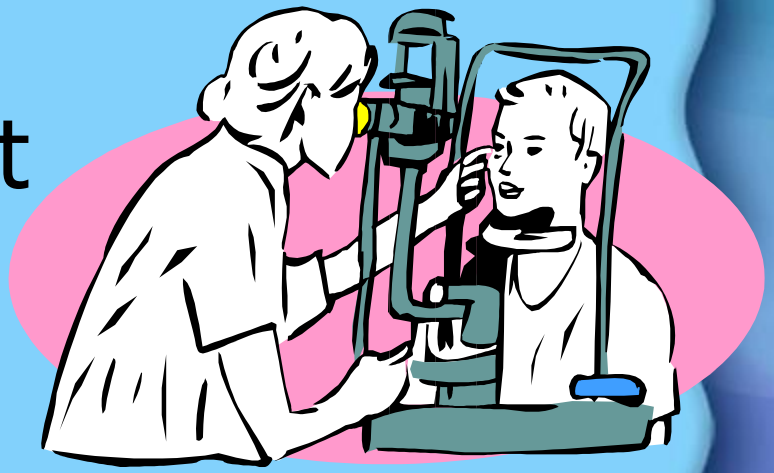
- Lane Position
- Decision Making
- Left Turns
- Right Turns

A Few More Techniques

- Use of Mirrors
- Distraction within the vehicle
- Distraction outside the vehicle
- Driving in familiar areas only
- Having a navigator
  - GPS Unit

YES! I Am on the Road Again

- Motor Vehicle Department Regulations
- Medical Review Program
- Physical Examination Report
- Vision Examination Report



- Staying on the Road Longer and Safer
  - Staying within the Letter of the Law
  - Driving as a Right vs. Privilege
  - Providing Adaptive Equipment or Techniques
  - Confidence in Self and Others

Case studies…

Contact information

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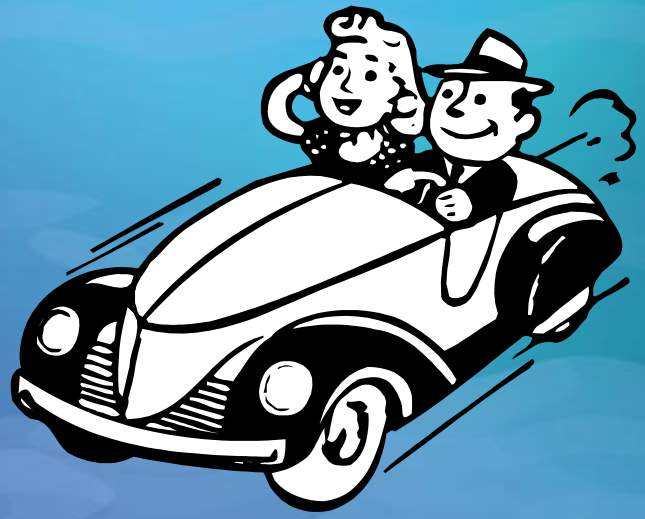

QUESTIONS??