THE VEHICLE MODIFICATION ASSESSMENT TOOL: IMPROVING THE TEAM APPROACH TO DRIVER EVALUATION

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Background:

The Vehicle Modification Assessment Tool (VMAT) was developed by Mercer Engineering Research Center under a contract with the Georgia Dept. of Labor, Rehabilitation Services (RS), the organization responsible for vocational rehabilitation services in this state. The tool was developed to provide rehabilitation professionals, having a wide range of experience involving vehicle modifications, with a resource for helping their clients make valid decisions regarding how best to modify their personal licensed vehicles.

Three major influences lead to the creation of the VMAT. First, RS restructured its Assistive Technology Unit to create an Assistive Work Technology (AWT) Service within the Vocational Rehabilitation Program. The AWT Service is hiring and training an eclectic staff of 29 FTE, including rehabilitation engineers, rehabilitation technologists, occupational therapists, and rehabilitation technicians in place of the contract services utilized previously. This created a wider variability in skill sets related to vehicle modifications than before. It also institutionalized the need for continued training support in this area to accommodate staff changes due to normal turnover. Staff who have limited knowledge or experience with prescribing or implementing adaptive vehicle modifications are unable to make effective recommendations to DRS counselors for funding purposes, nor are they able to participate effectively in driver evaluations, where recommendations are tested in-situ. It should be noted that only ADED certified driver evaluators who have the proper equipment and resources should be responsible for determining

the potential ability of a person with a disability to drive, and the adaptations needed to do so. However, AWT staff must be able to participate in the shaping of these recommendations in order to ensure the feasibility of modifications with respect to the client's functional, family, and community needs as well as with respect to RS funding limitations

The second influence on the decision to create the VMAT was, and is, the dependence of certified driver evaluators in Georgia on vendor-supplied evaluation vehicles for in-vehicle evaluation. Evaluators must evaluate candidates in vehicles with on-the-road testing in order to ensure that functions such as dynamic seating stability and multitasking capability are sufficient for safe driving. Since keeping a fleet of evaluation vehicles is prohibitively expensive for any organization, testing is usually done in a van modified to accommodate even the weakest candidate. Building a vehicle modified to fit the broadest range of functional abilities, however, requires the most expensive primary and secondary control adaptations, which, together with maintenance, insurance, and other costs makes it infeasible for most evaluation programs to afford also. In addition to the cost issue, though, having only the most expensive controls available for testing in most cases leads to the recommendation of these controls, even in cases where less costly alternatives might be feasible. One vendor in Georgia maintains such an evaluation vehicle, and makes it available by rental as a service to driver evaluation programs throughout a 5-state region. While this is not a bad thing in itself, it tends to give the vendor undue influence over the final recommendations and, because of the high-level equipment installed in the vehicle, tends to inflate the cost of the eventual recommendations.

Cost is the final influence that lead to the creation of VMAT. Vehicle modifications involve structural floor and roof modifications to full sized vans or minivans, servo controls (such as Digidrive), and touch screen secondary controls (such as Digipad Gold) for drivers in powered wheelchairs. These major changes together with the other required modifications can cost on the order of $60,000. This does not include the cost of the vehicle itself. Not only is the cost unsupportable as a common expense, even for a federally funded program like RS, but the maintenance and replacement costs for the consumer is infeasible in most cases.

VMAT is not intended to replace certified driver evaluators. It is intended, however, to allow RS Assistive Work Technology staff to provide their clients with disabilities a knowledge base from which to make informed decisions without undue influence from the vendors. Together, the client, counselor and AWT staff can investigate the options available for vehicle modification, while considering the trade-off decisions that invariably arise. The counselors, technologists and the consumers can play an active and effective role in developing prescriptions for vehicle modifications that will allow the individuals with disabilities to be productive in both the short- and long-term.

Methodology:
The Vehicle Modification Assessment Tool (VMAT) is a Microsoft Access application that uses a custom-designed Visual Basic user interface. The decision-tree based evaluation interface provides technologists a systematic means of isolating areas of functional limitation within the driving task, and then working with the client and the technologist to identify appropriate potential solutions. The reporting tools designed into the program give the technologist the ability to see and understand easily the types of adaptive equipment available to accommodate

each functional limitation. The CD format has pictures of specific devices so there will be no surprises during or after the evaluation. Copious notations are provided within the evaluation and report areas to help guide the technologists and consumers in making choices that best fit their needs.

The Edit Utility is the program set used to maintain and update the VMAT. It is also a Microsoft Access application with a Visual Basic user interface. It includes a program for changing the decision-tree including the number and types of questions asked, as well as the wording of the questions themselves. This software modifies both the database tables and the visual basic code. It is important to limit the number of users who can access the Edit Utility, since it may make individual databases incompatible, and thus limit the ability to merge data. The Edit Utility also includes routines for inserting notations, modifying the technology types that arise in response to user inputs, and for adding/deleting/modifying equipment and vendor data. This program will enable RS to continually refine the VMAT to keep up with changes in vehicle modification technology and practice, and continue to make it useful for the foreseeable future.

The Vehicle Modification Assessment Tool has two primary input forms: the Client Information and the Client Evaluation form. The Client Information form includes the personal, mobility and the vehicle information regarding the client. The Client Evaluation form includes the detailed information required to evaluate the client, based on the mobility and vehicle type provided in the Client Information form.

The Client Evaluation form features a tree structure that guides the evaluator to collect the information required to identify appropriate vehicle accommodations. The tree is subdivided into three levels. These levels are: Functional Area, Activity, and Limitation. The Functional Area identifies the major areas of the vehicle in which the client requires accommodation. The Activity level recognizes the physical components of each Functional Area. The Limitation level identifies the elements of each Activity that the client has trouble performing effectively. The evaluator can define a particular issue down to the Limitation level and identify it as a Problem Area by checking the appropriate box. When checked, the program asks further questions regarding the client's function in order to create a list of adaptive equipment types that are feasible to be used to accommodate the client. Notes may be displayed under 'Requirements' or 'Tech Requirements' to provide guidance in making decisions among the adaptive equipment types listed there. This technique allows the agency to capture and disseminate expertise in an effective and natural way. Figure 1 displays the tree structure. Once a Limitation has been selected, a check mark appears beside the Limitation and the associated Activity and Functional Area. This allows the technologist to identify problem areas at the top level without drilling down the entire structure. The selected item also appears in the text boxes located in the upper right side of the form. Selections are saved automatically in the Client Evaluation form.

Once all of the questions have been acknowledged, the suggested equipment categories are provided in the Technology grid at the bottom of the form. This grid provides a complete list of the available adaptive equipment types that fit the specified parameters. A short description of the adaptive equipment along with the technical recommendations is included if appropriate.

The VMAT will is used to investigate what options are available to accommodate an individual's need for transportation. Often, the client will not have a vehicle, and needs information on what type of vehicle might work best. Alternatively, he/she might have a vehicle and needs a way of making decisions regarding how feasible it might be to modify it. The evaluator and client might start out in the client information form choosing 'passenger car' to see what modifications can be made. In going through the client evaluation form, they may find a passenger car is infeasible. They can then switch back to the client information form, change their choice of vehicle, save the information, and switch back to the client evaluation form to see how well that scenario might work. This is a powerful way of investigating options, that allows the client to participate in making decisions while keeping those decisions realistic in terms of function and funding.

Clicking on any of the adaptive equipment types listed in the Technology Grid brings up a Technology Report. The Technology Report lists detailed information about the selected technology or adaptive equipment. This form also provides recommendations for the technology or adaptive equipment along with supporting issues. Equipment options are also listed at the bottom of the form. The user is allowed to select multiple options for equipment and vendors. Each of the selected adaptive equipment will be included in a Final Report, which can be printed out for inclusion in a formal report.

Discussion:

It is the intention of the Georgia Dept. of Labor, Rehabilitation Services, Vocational Rehabilitation Program to make available the VMAT software in a CD-format and the companion Home Modification Assessment Tool software CD-format. The VR Program would require a nominal fee, which would provide for periodic up-dates to keep the data current with evolving technology. ADED provides guidance for the certified driver's evaluator, and NMEDA provides certification and guidance for vehicle modifiers or vendors. However, little guidance exists for the AT service provider or counselor responsible for recommending or approving such modifications. One goal of this presentation is to "test the water" to determine if there is a wide spread need for this type of assessment tool.

The AWT Services has just received the beta version of the VMAT and data on its use and updates will be presented at the CSUN Conference.

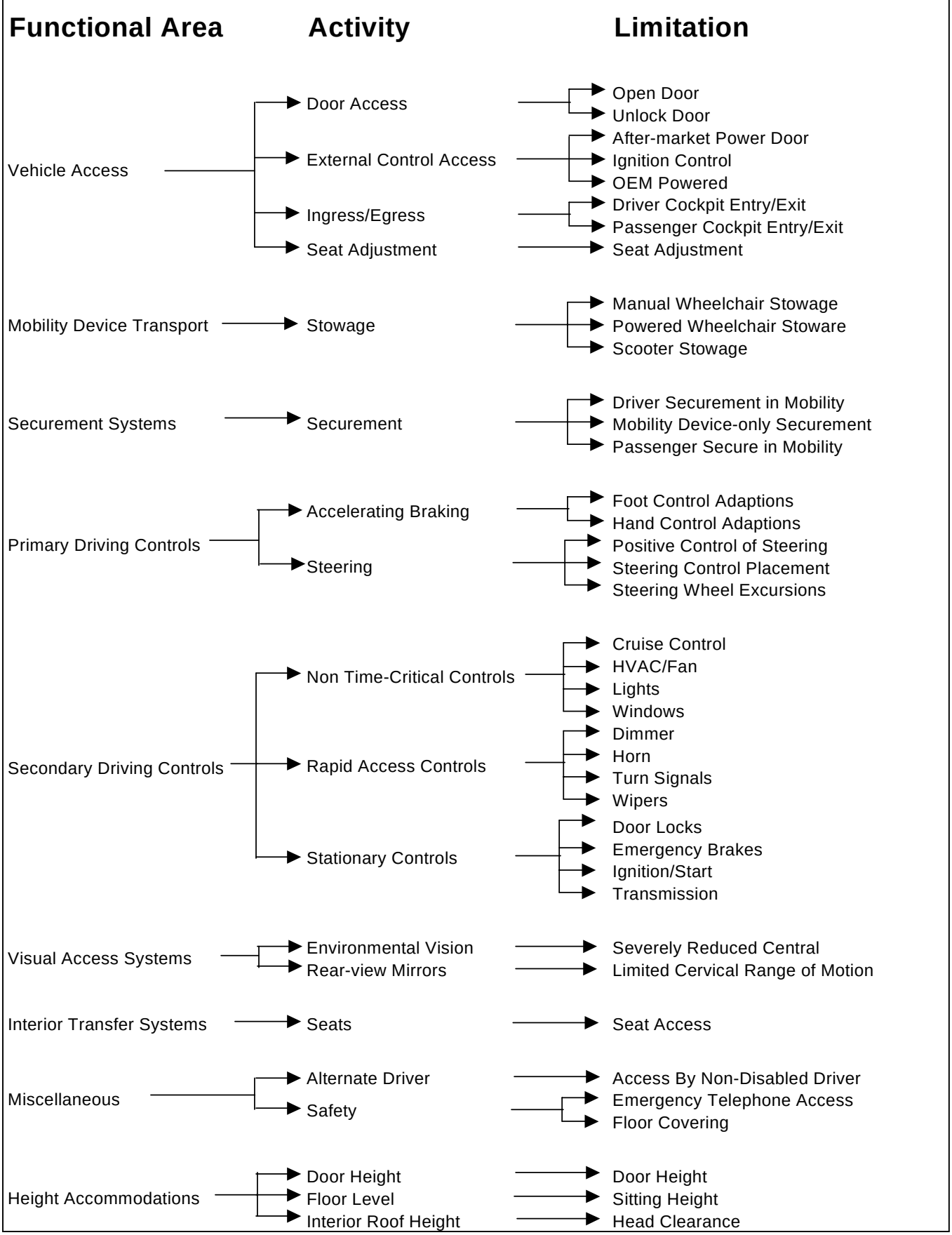

Figure 1. Tree Structure