

## Appendix A

### 1.0 GBC Traffic Safety Program

Based on the observed plateau effect (signifying an epidemic curve of continuous exposure over time lacking a defined peak) of MVC reported on the individual roadway network from 2004 through 2008 that there is an unrecognized public health problem in Otsego County. As part of the GBC construction project, we will integrate a coordinated community education and outreach program to investigate the etiology of MVC and the traffic safety culture related to knowledge, attitudes, behaviors and experience of residents in Otsego County.

*Hypothesis: A lack of traffic safety awareness in the community increases the risk of being involved in a motor vehicle crash.*

### 1.1 Survey Research

The first phase of the GBC Traffic Safety Program will include a public survey to estimate the extent of the problem in the population. Survey research is a valuable tool to assess trends in the general population. The survey will be administered using a combination of methods including telephone, postal service mailings and electronic media to gather data on the level of public awareness regarding traffic safety within the community. Telephone surveys will be the primary method of data collection based on an overall consensus in the scientific literature that telephone surveys administered by a trained interviewer tend to produce a better response rate and are more cost-effective. Since there is a potential to bias against households without land-line telephones, unlisted numbers or non-responders, surveys will also be mailed to households that cannot be contacted by telephone. In addition, a web-link will be provided on the Otsego County website for individuals interested in completing an on-line survey.

Study participants considered eligible and enrolled in the GBC survey research study, will include Otsego County residents  $\geq 18$  years of age with a valid Michigan drivers license. Using the random digit dialing technique, a culturally and educationally appropriate survey will be administered during a pretest pilot to determine if the questions are understood by the respondent and answered as intended. This process will help the researchers to evaluate the survey tool and identify any potential comprehension; question sequencing or wording problems prior to implementation. Following the completion of pre-test validation procedures, baseline and one year post construction surveys will be conducted.

A total of 1000 randomly selected participants will complete the survey during the baseline and follow-up study periods. The number of participants needed to provide a representative sampling of the general population has been statistically calculated using a confidence interval of 95% and a confidence level of  $\pm 4$ . Participants will be asked to anonymously complete the GBC Traffic Safety Survey. Every effort will be made to ensure the confidentiality of the participant. Each participant will be assigned a study number and will not be identified by name. All personally identifying information will be excluded. Telephone surveys will be completed by a trained interviewer and directly entered into an Excel database at the time of data collection to avoid transcriptional error.

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Data from completed surveys received by mail or on-line will be manually entered into the Excel database by a process of double data entry to ensure the accuracy of the data.

The interview staff will receive training on ethical research and proper scientific conduct. In addition each interviewer will be required to successfully complete the on-line human subject tutorial offered by the National Institutes of Health.

### 1.2 Community Outreach: Education & Safety Awareness

The second phase of the GBC Traffic Safety Program will include community outreach. In the interest of full disclosure, quarterly construction and progress reports will be published in the local newspapers and read or presented by the Education/Media Specialist on the local radio station. These media releases will also incorporate a relevant traffic safety message developed around the results of the county and township MVC data. The community will be encouraged to submit their thoughts, concerns and opinions of the GBC project to the staff. In addition, presentations with a question and answer session will be scheduled at the 9 publically held township board meetings, educational institutions, churches and at an annual town hall meeting. Information obtained from these venues will be used to monitor and evaluate the efficacy of the GBC Traffic Safety program. Educational materials developed by and purchased from the Channing Bete Company will be provided to the public free of charge.

### 1.3. Additional Data Sources

- **Michigan Crash Reporting System**

Data for the 24 counties of Northern Michigan and Otsego county level data pertaining to motor vehicle crashes will be abstracted on an annual basis from the Michigan Crash Reporting System maintained by the Michigan State Police. These data will be entered into an Excel spreadsheet for analysis. Data queried and abstracted, may include but not be limited to; gender, age, alcohol use, number and type of MVC, morbidity and mortality, property damage, contributing factors, roadway classification, vehicle miles traveled and various quality of life measures.

- **NEMCOG: Township Level**

In collaboration with the Northeast Michigan Council of Governments (NEMCOG), annual searches will be conducted to collect township level data utilizing the RoadSoft database. RoadSoft is a graphically designed, integrated roadway management system developed for Michigan's local agency engineers and managers to use in the analysis and reporting of roadway inventory, safety, and conditional data. RoadSoft uses the Michigan Accident Location Index (MALI) as a reference base. This reporting system is part of the Michigan Crash Reporting System of motor vehicle crashes by county. These data may include but not be limited to; age, gender, alcohol use, number and type of MVC, morbidity and mortality, contributing factors, MVC per road segment, date of MVC, day, time, weather conditions.

- **Road Segment Evaluations**

Traffic volume counts with classification, traffic volume and speed, date, day and time, pavement surface conditions have been collected prior to submission of this grant application. In the event that the applicant receives the proposed award, an additional set of traffic counts

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will be conducted to determine the overall impact of the completed GBC. These data will also be used in the overall statistical analysis.

- **Economic and Social Burden**

Motor vehicle crashes impose significant economic and social burdens through injury and loss of life, as well as property damage. Comparable and up-to-date cost data on MVC are essential in providing a common measure for evaluating cost and benefits of a proposed transportation project. These measures may include:

- Monetary (state-specific medical costs and earnings and a regional price adjuster): Hospital and physician care, EMS transport, rehabilitation, prescriptions, allied health services, medical device, nursing home care, insurance claims, coroner, premature burial due to fatalities. Also included in this category are victim legal expenses incurred in recovering medical costs from at-fault drivers and their insurers.
- Future Earnings: wages, fringe benefits, housework, insurance claims processing costs (i.e., life insurance claims for fatalities and Workers' Compensation claims for people victimized while working) and legal expenses incurred in recovering productivity losses from at-fault drivers and their insurers.
- Public Services: initial police response and follow-up investigation, emergency transport and fire services.
- Property Damage and Loss: value of property damage plus property insurance claims administration costs that arise in compensating victims' property losses.
- Nonmonetary: quality-of-life costs include costs associated with pain, suffering, other intangible losses and fear computed from the amount people routinely spend (in dollars or time) to reduce their risk of death and injury.

<b>Costs Per Police-Reported Motor Vehicle Crash in Michigan 2004</b>					
	<b>Fatal</b>	<b>Serious Injury</b>	<b>Moderate Injury</b>	<b>Minor Injury</b>	<b>Property Damage</b>
Medical Care	\$28,926	\$24,366	\$6,896	\$5,150	\$164
Future Earnings (Lost Wages)	\$1,443,491	\$63,292	\$16,788	\$12,298	\$546
Public Services	\$895	\$190	\$123	\$106	\$33
Property Damage & Loss	\$11,033	\$5,986	\$4,562	\$4,453	\$1,594
<b>Subtotal: Monetary Costs</b>	<b>\$1,484,344</b>	<b>\$93,833</b>	<b>\$28,369</b>	<b>\$22,007</b>	<b>\$2,339</b>
Quality of Life	\$2,692,099	\$118,019	\$31,596	\$18,689	\$585
<b>Total (Comprehensive)</b>	<b>\$4,176,443</b>	<b>\$211,852</b>	<b>\$59,965</b>	<b>\$40,695</b>	<b>\$2,924</b>

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Motor vehicle crash data will be evaluated in terms of the economic and social burden using the most currently available Michigan cost estimates. At the time of this application, this includes data based on 2004 MVC-related costs.

### 1.4 Statistical Analyses

Utilizing the public health problem solving sciences of epidemiology and biostatistics, descriptive and inferential analysis will be conducted on all continuous and categorical variables to provide a summary view of the study population, risk factors and trends over time. Categorical variables will be compared using Chi Square or Fishers Exact Test. Continuous variables will be compared using the ANOVA. The strength of the results will be reported as 95% Confidence Interval and a mean  $\pm$  the standard deviation. P values of  $<0.05$  will be considered significant for comparison studies conducted.

Pre and post-test survey data will be analyzed using regression analysis of surveyed individuals from two different randomly selected time periods. Assessed differences in characteristics of the two groups that have the potential to confound the comparisons of interest will be stratified with respect to age, education and gender. If differences in the population characteristics are identified between the groups, adjustments will be made accordingly.

The results of this research will be disseminated to the public through outreach activities and publication(s) in a peer-reviewed scientific/transportation journal. In addition, these research results will be used to set policies and guidelines to prevent MVC and implement educational outreach activities in Otsego County.

### 2.0. Potential Issues

There is a potential that a participant identified through random telephone, mail or the on-line method will not be suitable for inclusion in the randomly selected study population following completion of the survey. This could be due to missing data or a documented decision by the Research Director to exclude the participant in the overall analysis.

#### 2.1. Unrepresentative Sample

The sample is not representative of the population under investigation, prohibiting generalizations and inferences.

#### 2.2 Content Validity

Content Validity is based on the extent to which a measurement reflects the specific intended domain of content. There is a risk that what the investigators have defined and chosen as data for collection, analysis and inference, does not adequately measure the relevant domain.

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### 3.0 Staffing

This study will be directed by the GBC Research Director to ensure the scientific integrity of the research procedures and overall success of the project. Job descriptions are provided for each position at:

- Research Director: is responsible for the overall scientific integrity, oversight training and management of the project staff, completion of grant related quarterly progress and annual budget reports, regulatory compliance, development of educational and outreach public media releases, conduct of safety and public health research, perform survey interviews (as needed), database development and data collection, statistical analysis, interpretation and dissemination of results.
- Education/Media Specialist: will work with the Research Director to disseminate quarterly progress reports to the public regarding the status of the GBC construction status and related public health topics that affect the welfare of the population; not limited to press releases and reports, public speaking (as needed), development of media communications identifying key safety messages for educational materials, strategic communications as well as, other duties as assigned.
- Clinical Data Specialist: administrative duties related to; telephone interviewing, data input, quality assurance, and any duties deemed necessary by the Research Director.

### 4.0. Summary and Expectations

The primary aim of the GBC Traffic Safety Program is to evaluate the risk factors of MVC and improve traffic safety awareness of Otsego County residents. Safety awareness will be measured at baseline (prior to construction) and one year post construction of the GBC. We anticipate a minimum start up time since a majority of the components are already available within the existing system. The research team has experience in survey research. The facilities, equipment and local governmental support are outstanding, making for an ideal environment. In summary, we are confident of the plausibility of our hypothesis and the feasibility of our proposed scope of work. We anticipate that the time and resources requested are realistic for successful completion of the study.