

# CITY OF GRAND RAPIDS BICYCLE SAFETY EDUCATION PROJECT STUDY PHASE REPORT

Alta Planning + Design Grand Rapids, MI DRAFT - 2015

#### CONTENTS

I. INTRODUCTION
II. BEST PRACTICE REVIEW: BICYCLE EDUCATION CURRICULA
III. BEST PRACTICE REVIEW: MEDIA CAMPAIGN FOCUSGROUP RESEARCH
APPENDIX A: MEDIA CAMPAIGN FOCUS GROUP METHODOLOGY AND EXPANDED RESULTS
APPENDIX B: MEDIA CAMPAIGN SCAN
APPENDIX C: CRASH ANALYSIS REPORT60
APPENDIX D: COUNTERMEASURE IDENTIFICATION78
APPENDIX E: BICYCLE CODE OF
ORDINANCES REVIEW

#### ACKNOWLEDGEMENTS

City of Grand Rapids Michigan Department of Transportation Project Executive Steering Committee Project Steering Committee Consultant Team: Alta Planning + Design Cairn Guidance Greater Grand Rapids Bicycle Coalition Güd Marketing Wondergem Consulting









MARKETING THAT **MATTERS.**  This page intentionally left blank.

## I. INTRODUCTION

#### **PROJECT OVERVIEW**

The ultimate long-term goal for the Bicycle Safety Education Project is to reduce the total number of bicycle crashes, fatalities, and severity of injuries. The project's benefits will be multi-faceted. By broadening all citizens' knowledge of the rules of the road, it is desired that more cooperative and lawful behavior between cyclists and motorists will result. As more people ride comfortably in traffic and feel safe, the number of bicyclists that commute on a regular basis will increase and they will become more accepted as viable road users.

The Bicycle Safety Education Project is meant to create a foundation for a long-term safety program that will continue beyond the three-year duration of the project.

The Project is funded through a Federal grant and a local match. The grant's three major goals are summarized in the callout box below.

#### **Project Structure**

The Project is divided into four phases:

Project Phase	Description
Study Phase	The project team researched bicycle-car crash data from Grand Rapids and the surrounding area to look for contributing crash factors and patterns. The team reviewed bicycle safety educa- tion programs (both media campaigns and on-bike/ in-person educational offer- ings) from other communities. The team explored partner- ship opportunities from within the Grand Rapids area and worked to refine the proj- ect's study area. The team compared and contrasted bicycle ordinances from within the Grand Rapids communities.

### **Major Project Goals**

- Provide education and training on the operation of a bicycle in traffic.
- 2 Increase the knowledge of the responsibilities of bicyclists and motorists.
- **3** Promote a "share the road" culture.



The Study Phase consisted of a variety of analyses to understand Grand Rapid's existing culture of transportation.

Project Phase	Description
Development Phase	The second phase will develop a media and communication campaign for bicycle users and motorists based on the findings from Phase One & Two.
Implementation Phase	The Project Team will perform the targeted educational activities developed during Phase Two.
Evaluation Phase	The fourth and final phase will evaluate the project's effec- tiveness in achieving desired outcomes.

#### **REPORT PURPOSE**

This report summarizes the work performed during the Project's Study Phase (Phase One). The report is meant to inspire surrounding communities and communities throughout Michigan and the United States.



The Project's Steering Committee assisted the Project by reviewing reports, identifying important partners, and routinely meeting to discuss the Project's progress.

- 5 -

#### SUMMARY OF FINDINGS

#### **Overview**

The following recommendations are a synthesis of the project's definition of groups, locations, and situations at-risk for bicycle-car crash involvement. The Appendix further details the analysis undertaken to arrive at these recommendations.

### Curricula Recommendations

#### Main Curricula

The team recommends the use of curricula from the League of American Bicyclists (LAB), a national advocacy group. LAB materials scored highly in an objective bicycle curricula review. See Chapter II for more details.

#### **Local Customization**

The project recommendations are to customize LAB curricula to address local concerns and characteristics. Law enforcement, the project's Steering Committee, and the public at-large contributed input regarding local concerns that should be discussed in the resulting educational

#### materials

For instance, law enforcement officers voiced concern about clarifying bicyclists' and drivers' responsibilities surrounding: riding two abreast, bicyclists' responsibility to obey traffic control devices, drivers' responsibility to obey traffic control devices.

Officers also sited specific intersections where they feel miscommunication, conflict, unlawful conduct, or crashes frequently occur.

## Media Campaign Recommendations

The Development Phase will further refine the media campaign including a plan for the deployment of print media in the public way, and/or other media placements such as radio ads.

#### **Target Audience**

The media campaign will focus on people who ride a bicycle and people who drive.

People who ride a bike:

The Study Phase analysis found a discrepancy between area demographics and crash victim demographics.

Campaign materials will target young adults, especially those under 24. Males made up 80% of the bicyclists involved in crashes.

People who drive:

The Study Phase found that the demographics of drviers involved in crashes matched the study area demographics. Campaign materials will target all drivers. Materials may address people driving near schools in particular, given high numbers of youth bicyclists' involvement in crashes after school hours (3-7pm).

#### **Objectives**

Campaign objectives will be developed to reflect the objectives identified during the final rescoping.

#### **Potential Media Locations**

Refer to page 60 for a list of high crash corridors. These places, as well as intersections identified in the public and law enforcement officer surveys are prime candidates for high visibility, targeted media placements (i.e.- printed posters).

7 -

## II. BEST PRACTICE REVIEW: BICYCLE EDUCATION CURRICULA

#### **OVERVIEW**

The consultant team reviewed five leading bicycle safety education curricula, using a **custom method-ology called the Bicycle Curriculum AssessmentTool (BiCAT)**.

Based on the best practice review results, the project team presents the recommendation shown in the callout box below.

### **Recommendation:**

The team recommends the City of Grand Rapids use the existing League of American Bicyclists (LAB) educational materials, with modifications to customize the curriculum to fit local concerns.



Bicycle education can include the entire community- from residents who bike everyday, to casual riders, to law enforcement officers.

#### League of American Bicyclists (LAB) Curriculum Strengths

LAB materials will provide quality education for the greater Grand Rapids area:

- LAB materials scored highly with regards to the BiCAT review.
- League Cycling instructors (LCI) should be recruited to teach bicycle education classes.
- LCI course leaders are covered by the League's liability insurance when teaching courses.
- LAB course materials updated in 2015 resulted in improvements in the "Acceptability" BiCAT domain. The updated graphics contained within the updated LAB materials represent a racially/ethnically diverse program audience.
- LCIs have access to all LAB educational materials including presentations, videos, handbooks, and forms including test forms.

#### Areas to Improve Existing LAB Curriculum

The team recommends the following improvements to the LAB curriculum:

- Existing participant assessment measures: Self-evaluations and instructor-led evaluations should offer meaningful feedback throughout the course. Although current programs offer evaluator exercises, the Study Phase found that these tools are in need of updating. The team also found a need for improved assessment tools.
- **Program evaluation:** The team recommends that efforts to improve existing program evaluation methods be pursued using the LAB website for online registration and doing pre and post evaluation of students to evaluate class effectiveness.

8

#### CURRICULA ANALYSIS METHOD

The Bicycle Curriculum Analysis Tool (BiCAT) was created in 2014 to review and compare adult bicycle safety education curricula.

#### Materials Evaluated Using BiCAT Method

The BiCAT method helps compare bicycle education resources. The team reviewed five curricula using the BiCAT evaluation tool. Table 1 shows the resources selected for review. With the exception of BikeSafetyQuiz.com, developed by the League of Illinois Bicyclists (LIB), all materials originated from national-level agencies and organizations in the US, UK, and Canada. A national organization called the American Bicycling Education Association produces a course series called Cycling Savvy. Although the review team attempted to obtain access, no sample course materials were available for purposes of the BiCAT review.

Table 1. Materials	Reviewed	Using	BiCAT
--------------------	----------	-------	-------

Curriculum Name	Organization		
Bikeability Delivery Guide	Bikeability (UK Department for Transport)		
CAN-Bike Toolkit	Cycling Canada		
BikeSafetyQuiz.com	League of Illinois Bicyclists (LIB)		
League Cycling Instructor Handbook, Various course materials (i.e Smart Cycling, Group Riding), Performance scoring templates	League of American Bicyclists (LAB)		
Walk and Bike Safely: Teacher's Guide	National Highway Traffic Safety Administration (NHTSA)		



Skills training will help teach people who currently ride bicycles as well as people who would like to learn more.

#### **BiCAT Scoring**

The BiCAT tool consists of the sections outlined in Table 2, below. For a detailed description of the Preliminary Curriculum Considerations section metrics, refer to the callout box on the facing page.

Tahle '	2 R	ίCΔΤ	Scor	inσ	Sect	ione
TUDIE 2	2. DI	CAL	SCUL	ing.	SECL	IONS

Scoring Section Name	Scoring Metrics Used	Scoring Method
Preliminary Curriculum Considerations (see Table 3 for a detailed description)	<ul> <li>Accuracy</li> <li>Acceptability</li> <li>Feasibility</li> <li>Affordability</li> <li>Curriculum Design</li> <li>Learning Objectives</li> <li>Facilitator Guidance</li> <li>Instructional Strategies and Materials</li> <li>Teaching Skills</li> <li>Participant Assessment</li> </ul>	<ul> <li>Reviewers answer a series of questions with "yes" or "no" responses.</li> <li>Reviewers score a given curriculum based on the percentage of "yes" answers.</li> </ul>
Concepts ("By the end of the program, participants will understand/know/ explain")	These items tested whether partici- pants would have exposure to a variety of concepts such as lane placement, common crash factors, an understanding of bicycle laws, etc.	Reviewers use a list of pre-iden- tified concepts to note which are discussed within a given curriculum.
Skills ("By the end of the program, participants will have an opportunity to demonstrate")	These items tested whether participants had the chance to demonstrate certain on-bike skills during the curriculum's educational modules.	• Reviewers use a list of pre-identified skills to note which are discussed within a given curriculum.

## **Curriculum Consideration Metrics**

#### Accuracy Analysis:

A measure of the curriculum's use of appropriate terminology, safety data, and other facts.

#### Acceptability Analysis:

A measure of how appropriate the materials are for the intended target audience according to community norms and cultural experiences as well as how appropriate the content is for adult learners.

#### Feasibility Analysis:

A measure of whether courses can be implemented within the given amount of time.

#### Affordability Analysis:

A measurement of initial material costs, implementation costs, and additional costs required to sustain the program.

#### **Curriculum Design:**

A measure of the courses' logical progression through a series of skills and safety behaviors.

#### Learning Objectives:

A measure of learning objectives' clarity and measurability as well as consistency with safety education.

#### Facilitator Guidance:

A measure of how well the curriculum prepares instructors for facilitating the course.

#### Instructional Strategies and Materials:

A measure of whether the content is interactive and culturally and developmentally appropriate for participants.

#### **Teaching Skills:**

A measure of the guidance available to instructors for leading the course sequence.

#### Participant Assessment:

A measure of tests, performance events, and other means for participants to check their own skills as well as assessment materials for instructors to measure students' progress.

#### Major Findings

Reviewers developed the following general conclusions based on the existing materials:

- Evaluation process: Some curricula do not involve large evaluation components. These curricula's decentralized registration processes mean the effectiveness of bicycle education courses are often difficult to evaluate.
- Available resources: Due to competing needs, bicycle education courses often operate using small budgets. Lack of resources can inhibit education programs' growth.
- Skill development and knowledge development: Curricula should balance concepts learned in the classroom with hands-on skills demonstrated on-bike. The reviewed curricula obtained varied scores with regards to learning objectives' clarity and measurability. The same is true for how well the curricula assess student learning and progress.
- Vocabulary acquisition: The NHTSA *Walk & Bike Safely* curriculum engages a different target audience than other curricula. The NHTSA materials focus on engaging newly arrived immigrants, who are English language learners. Therefore, the materials' focus on vocabulary acquisition to ensure that course participants receive a foundational understanding in traffic terminology. The choice is important from a functional and a safety perspective. The course's decision to use the term "collision" or "crash" instead of "accident" helps reinforce the lessons. There is a section for instructors, which describes reasons for selecting specific terms.
- Curriculum organization and work flow: The reviewed curricula logically progress through a series of in-classroom and on-bike assignments to teach and reinforce bicycle safety skills. Clearly dividing a curriculum into "observed demonstrations", "reasoning" (making the case for a lesson's

importance), "delivery guidance" for instructors, and "participant demonstrations", all help to reinforce student skills. The Bikeability Delivery Guide is organized as such.

 Instructor materials: The reviewed curricula prepare educators for teaching the course by producing guides specifically for the instructors' use.

#### **Curriculum Consideration Scores**

Reviewers scored each section according to a series of relevant "yes" or "no" questions. Final score percentages relate to the number of "yes" responses. A higher percentage, representing a greater number of affirmative responses, indicates a greater accomplishment of that section's goals.

The curriculum approach to be pursued should take the following findings into account. For instance, the resulting project curriculum should seek to improve areas in which other curricula traditionally score poorly.



The BiCAT process reviewed curricula to investigate whether they teach a variety of concepts, including the potential risks involved with wrong-way riding.

Major findings include:

- All reviewed curricula score highly in the Curriculum Design section (100%). This means existing curricula reinforce previously learned safety behaviors as the learner continues throughout the respective curriculum.
- All reviewed curricula score highly in the Facilitator Guidance section (83%). This means existing curricula are able to adequately prepare course instructors for their roles.
- Curricula score far lower in the Learning Objectives section (58%). This means curricula do not always contain measurable and/or clearly written learning objectives. The Learning Objective scores across all curricula also had the highest amount of variance between scores; while the League of American Bicyclists materials ranked highly in the Learning Objectives category with 92%, BikeSafetyQuiz.com received 0%.
- Curricula received a low score in the Participant Assessment (56%) section. This means the curricula do not use rubrics or scoring guides to assess students' performance. There are not often materials for students to check their own performance. Curricula scores vary with regards to the Participant Assessment section. While the NHTSA materials received a score of 22%, BicycleSafetyQuiz.com received a 100% rating. LAB and Bikeability also received low scores of 44% and 56%, respectively.
- Curricula affordability was difficult to assess with the materials provided. Curricula did not provide clear indications of the courses' price structure. This information is provided through other means, such as program websites or by direct contact with the organization.

	Accuracy Analysis	Acceptability Analysis	Curriculum Design	Learning Objectives	Facilitator Guidance	Instructional Strategies and Materials	Teaching Skills	Participant Assessment
Average Score	100%	85%	100%	58%	83%	67%	82%	56%

Table 3. Average Section Score across Curricula

#### Curricula Skills Content

The BiCAT asks reviewers to assess curricula for in-classroom or on-bike explanation of certain topics related to safety skill and knowledge acquisition.

Table 4 and the following bullet points summarize findings from the curricula skills analysis:

Table 4. Summary of Skill Content Findings

Skills Content Found Across	Skills Content Found Across
Many Curricula	Few Curricula
<ul> <li>Proper bicycle fit</li> <li>Proper helmet fit</li> <li>Common crash reasons between motorists and bicyclists</li> </ul>	• Helmet Laws

- The reviewed curricula focused on similar sets of safety skills. The NHTSA curriculum, Walk & Bike Safely deviates the most in terms of skills taught to course participants.
- All curricula discusses helmet and bicycle fit as well as common crash factors between motorists and vehicles. Only one curriculum discussed area helmet laws. The topic may have scored low ratings due to the absence of helmet legislation within the curricula's respective locations.
- All curricula presented information about common crash types, such as "right hook" or "left cross" situations. Curricula presented strategies to keep cyclists safe, such as riding away from the "door zone", an area to the left of parked cars, where passengers or drivers may open doors into the path of people passing on bicycles.

- The NHTSA Walk & Bike Safely curriculum focused on a select number of safety topics, as opposed to educating participants about a wider range of skills.
- Due to incomplete access to resources, reviewers did not score the CAN-Bike curriculum according to skill content.

#### **Curricula Skills Demonstration**

Reviewers assessed whether skills originally discussed conceptually (i.e.- in a classroom setting), were demonstrated through on-bike drills or other exercises that allowed participants to practice these concepts.

Table 5, below, summarizes the reviewed curricula's scoring in relation to opportunities for students to demonstrate key skills.

#### Table 5. Summary of Skill Demonstration Findings

Skills Demonstration Found	Skills Demonstration Found
Across Many Curricula	Across Few Curricula
<ul> <li>Checking a bicycle before riding (i.e an "ABC" Quick Check)</li> <li>Proper helmet fit</li> <li>Proper bicycle fit</li> <li>How and where to properly place safety equipment (i.e front and rear lights, other reflectors, etc)</li> <li>Obeying traffic signals and stop signs</li> </ul>	<ul> <li>Route selection for safety</li> <li>Demonstrate how to securely lock a bicycle</li> </ul>

The following points represent a summary of findings related to the skills demonstration analysis:

- Most curricula contained on-bike skill demonstration modules. The NHTSA Walk & Bike Safely curriculum included practice tips for students outside of class sessions. The BicycleSafetyQuiz.com curriculum does not contain on-bike skills practice sessions, although the lessons are designed with the idea that students will use the concepts when they ride a bike or drive a car.
- Skill demonstration findings are similar to those discussed within the University of British Columbia & Simon Fraser University study. The Canadian study found a lack of bicycle safety curricula that discuss and practice how to safely plan bicycle trip routes.



The project's kick-off study tour involved new bicycle amenities and infrastructure. Educational programming will help residents feel more comfortable bicycling in the city.

## III. BEST PRACTICE REVIEW: MEDIA CAMPAIGN FOCUS GROUP RESEARCH

#### **RESEARCH OBJECTIVES**

The Study Phase began with an evaluation of Grand Rapids crash data, an exploration of existing research, and a review of bicycle safety education programs. The secondary data was used to evaluate crash patterns and factors unique to Grand Rapids, identify audience priorities, prioritize project objectives and learn from existing programs and communications across the country. The information learned through secondary research provided input into the next part of the Study Phase – primary research.

Because a successful campaign will need to reach multiple target audiences – all motorists and all bicyclists – primary research was designed to gain a strong representative sample of both groups. An online survey available to all residents of the Greater Grand Rapids area followed by an in-person focus group session composed of both motorists and bicyclists were completed.

The purpose of primary research was to:

- 1. Understand the attitudes and behaviors of both motorists and bicyclists
- 2. Define current beliefs
- 3. Uncover message preferences
- 4. Gain direction for messaging success
- 5. Determine unique audience needs and opportunities for targeted messaging

Key findings for each goal are discussed in the executive summary.

#### **EXECUTIVE SUMMARY**

1. Understand the attitudes and behaviors of both motorists and bicyclists

- General confusion about the new bicycle "activities" in Grand Rapids. Nearly everyone recognizes the changing infrastructure (decals on the streets, signage, bike lanes, etc.), but most – particularly motorists – are not quite sure what it means to them and how it should affect their own behavior. Many believe that the new infrastructure, intended to make Grand Rapids "bicycle friendly," provides a great opportunity to build awareness of the rules of the road.
- Both audiences believe that "bikes and cars can do better together." National coverage of this issue illustrated a deep anger and significant divide among motorists and bicyclists. While there are certainly examples of extreme situations in Grand Rapids (verbal/physical abuse), all indications point to a community that believes it is realistic to "help bikes and cars do better together." Both motorists and bicyclists believe that Grand Rapids can come together to be more harmonious.
- Everybody is a "driver." Survey feedback and focus group discussions delved deeply into the specific attitudes, behaviors (and faults) of each audience, the fact that everybody is a "driver" emerged as a key insight that united both audiences during the focus group. Motorists rallied around the idea that bicyclists are "drivers" in a different type of vehicle and bicyclists took away that they needed to "act like a vehicle." The idea of a "driver" encouraged bicyclists to follow the same rules as motorists and for motorists to treat bicyclists as they would any driver, allowing them the right to share the road.

• Regardless of fault, cyclists appreciate their vulnerability and acknowledge that it is ultimately up to them to provide for their own safety. Cyclists are well aware that an encounter with a vehicle will cause greater harm to them than to the motorist even if the driver is at fault for the crash. Cyclists tend to assume varying levels of responsibility for their own behavior, depending on their personal experience and feeling of safety on the road.

#### 2. Define current beliefs

- Prevalent belief that "others" are the problem. It is no surprise that the blame for crash incidence is assigned to "other people." Individuals who ride bicycles cited motorists' bad driving behavior as the factor most likely to contribute to crash incidence, while drivers who do not bike cited bicyclists' bad riding behavior as most likely to contribute. It is important to note that both audiences believe that the poor actions of a few fuel the lack of respect between cyclists and motorists. Many individuals believe that visible enforcement of the rules – for example, ticketing cyclists who run red lights, and motorists who pass too closely – could improve the situation.
- "Motorists need to know that bicyclists have the same right to the roads as bicyclists." A striking number of motorists are unaware that cyclists are not only allowed on the road but are supposed to ride on the road. Knowledge of rules (checking bike lanes before making right turns, bikes riding with traffic, etc.)and common courtesies (leaving the legally required three feet when passing a cyclist, etc.) is also severely lacking in a large group of motorists.

- "Bicyclists need to understand, and follow, the rules." There is universal agreement that bicyclists should ride in a consistent and predictable way but that many do not. Motorists are frustrated by unexpected behavior (cyclists not stopping at lights or stop signs, not pausing at driveways). Bicyclists are frustrated because they know that the actions of a few fuel a general lack of respect.
- 3. Uncover message preferences
- Messages that are inclusive of both motorists and bicyclists rose to the top. Of the twelve ads that were tested, not one was a clear-cut winner for all types of motorists or cyclists. However, the message "Same Road. Same Rules." did rise to the top for many, as it seemed to achieve multiple objectives – to educate motorists about bicyclists' right to use the "same road" (i.e., share) and to educate bicycle riders about their need to operate by the "same rules" (i.e., stop at red). This message was generally better received because neither audience felt blamed or singled out to make all of the behavior changes necessary to reduce crashes.
- Messages that focus on specific behaviors were also effective in demonstrating the rules and the responsibilities. People who ride bicycles rallied around messaging that directed motorists to give space while passing, which is one of the biggest issues to cyclists. Motorists responded well to messaging reminding cyclists to stop at red lights, which is one of motorists' biggest concerns. This type of messaging was appealing for its simplicity, clarity and directness in addressing specific behaviors.

• "Share the road" was not enough. Motorists generally disregarded direct "share the road" messaging. Many felt they already do "share" but that this is not the problem they are seeing on the roads – that the problem is a result of individual/ specific behavior. They also felt the "share" message alienates drivers, assigning misplaced blame. Furthermore, when asked to identify messaging that would change their own personal driving/riding habits, "share the road" messages are at the bottom of the list.

#### 4. Gain direction for messaging success

Effective communications campaigns capture the attention of the target audience, are easy to understand and remember and do not require further explanation. There must be a laser-like focus on campaign objectives and a deep understanding of the audience. Takeaways from research suggest that campaign messaging should:

- Provide a platform for awareness of bicycle safety that allows for individualized messaging and education directed to specific audiences
- Promote awareness and benefits of a bicycle friendly community
- Educate the public about the rules, rights and responsibilities of each audience
- Be inclusive of both motorists and bicyclists focusing on things that bring them together
- Be simple and clear

## 5. Determine unique audience needs and opportunities for targeted messaging

The target audience of the public communications campaign will be broad, speaking to both motorists and bicyclists of all ages, genders, attitudes, behaviors, etc. However, there are distinct opportunities to target high-risk riders as well as those who influence them (parents, peers, law enforcement, trusted advisers). There are also opportunities to target individuals based on their riding frequency and experience. Key inputs from primary and secondary research that will inform the development of targeted media and messaging for these unique audience segments and geographic locations are highlighted below.

• Young male cyclists, as evidenced by Grand Rapids crash data, are an audience at high risk of crash, injury and fatality. Young men are significantly less likely to obey traffic signals and stops, ride with traffic, or signal turns than older riders and even female riders of their age. Research also shows that young males demonstrate perceptions of "invincibility" and are highly susceptible to peer pressure, causing them to not follow the rules (particularly in helmet usage). Importantly, we also know that enforcement can play a strong role in encouraging compliance with rules/laws among young males, as this audience is often more motivated by personal consequences rather than by personal safety.

- Spanish-speaking audiences mirrored Englishspeaking respondents in many ways: in types of encounters with motorists and cyclists, in distance traveled, and in roadways used. They also shared similar attitudes, behaviors and general response to messaging. However, this audience did show a greater preference for messaging encouraging respect and sharing.
- Occasional riders and veteran riders vary in their awareness of and adherence to road laws and ordinances. Messages targeting specific behavior can improve both areas. Messages to occasional riders should build awareness of the importance of wearing a helmet, riding on roads, riding with traffic, signaling turns. Veteran riders must be convinced of the need to obey traffic signals and signs in all circumstances.
- Law enforcement is a critical audience for this effort. Communication with law enforcement can build awareness of the importance of the laws, can help officers understand/appreciate new ordinances, and can help improve data collection on crash reports for better tracking of the issue over time. Law enforcement should be an advocate for education about the laws and about safety (especially with key audiences) and for uniform enforcement of the laws for both motorists and bicyclists (as appropriate). This audience is an important partner for the distribution of materials and messages in the community.
- Geographic locations. High-crash corridors should be an important area of focus in all phases of the project. Frequent riders point to concerns about safety outside that of the motorist/cyclist dynamic

   roads that are in bad condition, roads that are not clean/maintained, confusion in signage, issues with lights/stop signs, routing concerns during construction, etc. Communications can play a role in addressing some of these issues and may take the form of signage recommendations, public relations, and grassroots activity in certain areas if the budget allows.

In depth information regarding focus group methodology and results can be found in the Appendix.



## APPENDIX

The long-term goal for the Grand Rapids Bicycle Safety Education Project is to reduce both the total number of bicycle crashes and fatalities and the severity of injuries.

## APPENDIX A: MEDIA CAMPAIGN FOCUS GROUP METHODOLOGY AND EXPANDED RESULTS

#### **METHODOLOGY**

An online survey was used to gather information from residents of the Greater Grand Rapids area. Links were deployed via Bicycle Safety Education Steering Committee members, social media, and traditional media coverage to reach the greatest possible number of community members. Respondents could complete the survey in English or Spanish.

- Survey was fielded April 14-May 6, 2015
- 2,247 responses

-Overall respondent profile provides a representative sample of ages, genders and number of children.

-Survey respondents were significantly more educated than is typical of Kent County. Seventy-eight percent of respondents had a college or graduate degree, compared to only 32 percent of the county's population achieving that level of educational attainment.

-Respondents also skewed toward higher income brackets. Only 13 percent of respondents indicated incomes below \$35,000; within the Kent County population as a whole, approximately 33 percent have incomes below that amount.

-Only 39 respondents chose to take the survey in Spanish.

Survey respondents were sorted into two distinct groups when taking the survey based on their answer to the following question:

How often do you typically ride a bicycle in the spring, summer or fall?

- 1. Cyclists anyone who indicated they typically ride a bicycle on a daily, weekly or monthly basis.
- 2. Motorists anyone who indicated they typically ride a bicycle quarterly, annually or never.

Cyclists constituted 80 percent of all responses, with motorists accounting for the remaining 20 percent. In addition to the broader questions that were answered by both groups, cyclists and motorists were each given a unique set of questions about their behavior and interactions with the other group of respondents. Throughout this report, data will be reported in reference to the four self-reported cycling frequencies: daily cyclists, weekly cyclists, monthly cyclists and motorists.

#### **KEY FINDINGS**

- A small number of respondents (39) completed the Spanish-language survey. Given the small sample size, that data was evaluated for directional guidance rather than as representative of the Greater Grand Rapids Spanish-speaking community.
  - -Spanish-speaking respondents were demographically quite different from the others - younger, more likely to have children at home, less likely to have completed college and reporting lower income than the overall survey respondent profile.
  - -Spanish-speaking respondents showed a marked preference for messaging encouraging respect and sharing but did not otherwise differ significantly from Englishspeaking respondents.
  - -Overall, Spanish-speaking responses did not vary significantly from English-speaking respondents. As a group they reported rates of rule-following, negative encounters with motorists or cyclists, distances traveled and roadways used similar to those of the 2,000+ English respondents.
- Demographically and in terms of behavior there is significant variance according to the frequency of cycling.
  - -Daily riders are men who ride on all roadways and in all seasons. Daily riders are more likely and in many cases significantly more likely than less frequent riders to always wear a helmet, signal turns, and ride with traffic. But they are also significantly less likely to obey traffic signals and signs.

-Weekly riders are men and women riding mostly on neighborhood streets and trails for fitness and health reasons. Weekly riders frequently, if not always, wear a helmet, obey traffic signals and signs, signal turns, and ride with traffic.

-Monthly riders are women with children still at home, riding short distances on neighborhood streets or on sidewalks. Monthly riders are least likely to wear a helmet, signal turns, or ride with traffic. Monthly riders tend to align with motorists in beliefs about cause of accidents and about responsibilities being a cyclist's duty.

• Crash data identified young men as most likely to be involved as the cyclist in a bicycle/motor vehicle crash. Responses by both men and women age 18–29 show significant differences in cycling behavior compared to older riders as well as difference in message/ad preference compared to older audiences.

-Young men are significantly less likely to obey traffic signals and stops than are older riders or female riders their own age.

-Young adult riders, both males and females, are significantly less likely to observe safety measures like wearing a helmet, riding with traffic or signaling turns. • There were limited differences among people living in the city, suburbs and rural areas of the Greater Grand Rapids area. Messaging and ads were appealing across locations, leaving the differences limited to behavior.

> -City dwellers tend to make shorter cycling trips and use a bicycle as transport around town or to work, and they ride city streets most often.

> -Suburban and rural riders are more likely to bike for a family activity and slightly more likely to obey all rules than are their city counterparts.

• Men and women have a few significant differences when it comes to cycling behavior, problems on the road and message preferences.

-Men are much more likely to ride more often and to ride greater distances than women.

-Women are more likely than men to always wear a helmet and to obey traffic signals and signs.

-Data would indicate that motorists treat men and women cyclists differently on the road; for example, choosing to follow female cyclists rather than passing too closely to them, which is a motorist behavior reported much more frequently by male riders.

• Most cyclists frequently or sometimes feel safe while riding. There is no significant difference in the feeling of safety indicated by different ages, genders, residence location or cycling frequency.

> -Cyclists who indicated they never wear a helmet were significantly more likely to indicate they always or frequently feel safe while riding, than reported by all other cyclists, including those who always follow all safety rules.

• None of the tested messages or ads were chosen as a clear-cut, top message for all types of cyclists or for motorists.

-Messages and ads that spoke to both cyclists and motorists were generally better received because neither audience felt blamed or singled out as being required to make all of the changes necessary to reduce crashes. However, most respondents - whether cyclists or motorists felt their behavior and the behavior of the group they identified with was not the problem, so the messages and ads were interpreted as speaking only to the other audience.

 Certain messages appealed to respondents, or respondents liked them, but that does not mean the messages are likely to change behavior of the respondents. In fact, several messages were selected as being good for reducing bicycle/motor vehicle crashes, but respondents nevertheless said they would not personally change their riding or driving habit as a result of seeing the message.

> -Both cyclists and motorists identified "Share the Road" as a message they believed would reduce the number of bicycle/motor vehicle crashes; however, when asked which message would change their driving or riding habits, the "Share the Road" message fell to the bottom of the list.

> -Motorists' top response was to say that none of the messages would get them to change their driving behavior, indicating an uphill battle with drivers to encourage any behavior change among them.

#### AWARENESS: BICYCLE CAMPAIGNS

The majority of cyclists and motorists are unaware of any ongoing bicycle safety campaigns.

- Only 12 percent of motorists and 16 percent of cyclists were familiar with a bicycle safety campaign.
- Cyclists who were familiar identified Greater Grand Rapids Bicycle Coalition, Spoke Folks, Share the Road, People for Bikes, miscellaneous free helmet events, Safe Streets, 3FT campaigns and this project from the City.
- "Share the Road" and this City project were identified most often by motorists who were aware of a bicycle safety campaign.

Additionally, 22 percent of cyclists identified themselves as a member of a cycling advocacy group. Rapids Wheelmen, West Michigan Mountain Biking Association, International Mountain Bicycling Association and a variety of cycling/triathlon teams were the top groups listed by respondents.

Figure 1.



Are you aware of any bicycle safety campaigns? (Cyclists Responses Only)

#### CYCLISTS: TYPE OF RIDING

Cycling respondents averaged a wide range of distances per trip. Typically, daily riders tended to report the longest trips, while those riding monthly did not ride as far.

- Suburbanites tended to ride significantly farther than city dwellers.
- Riders aged 21–29 tend to travel short distances, while riders 30+ years old were more diverse in their riding distances.
- Women also tend to ride significantly shorter distances than men.

Figure 2.



## On average, how far do you bike per trip?

#### CYCLISTS: TYPE OF RIDING

Daily and weekly riders were more likely than monthly riders to ride on all types of roads and paths, except for sidewalks. Daily cyclists were almost twice as likely as monthly riders to ride on city streets, and more than twice as likely to ride on rural roads and to do off-road riding.

- Men were significantly more likely than women to ride on city streets and rural roads.
- Riders in their 20s were most likely to say they typically ride on sidewalks.
- Not surprisingly, city dwellers were most likely to ride on city streets, and rural residents most likely to ride on rural roads.



Health and fitness dominate the reasons that respondents ride, followed by fun. Daily riders are most likely to use their bike to commute to work or to get around town, but enjoyment and fitness motivate the decision to ride, rather than economics.



Figure 4.

#### CYCLISTS: RULE ADHERENCE

Respondents who indicated they rode a bike on a monthly basis were significantly more likely to say they did not always ride with traffic or wear a helmet while riding than were respondents who ride more frequently. A reason for both behaviors could be the type of riding monthly riders are engaging in – short distances on sidewalks, paved trails and neighborhood streets.

- More than half 56 percent of monthly riders said they did not always wear a helmet, and 25 percent of thaT group never wear a helmet.
- All cyclists daily, weekly and monthly riders aged 21–29 were significantly less likely to always ride with traffic and to wear a helmet than were respondents aged 30+.
- Among monthly riders, women were significantly more likely than men to always wear a helmet.
- Men who ride monthly were significantly more likely to ride with traffic than women who ride monthly.





- 29

#### CYCLISTS: RULE ADHERENCE

Those who ride more frequently are more likely to signal their turns but less likely to obey traffic signals and stops. They also were most likely to dress in bright clothing while riding.

- Daily riders are most likely to ride on city streets but least likely to obey traffic signals and stop signs.
- Riders in their 20s are less likely than older riders to signal turns and obey traffic signals. This is true for daily, weekly and monthly riders in their 20s compared to older riders.
- Women are significantly more likely than men to always obey traffic signals and stop signs.
- The percentage of respondents who always wear bright clothing while riding corresponds to age those in their 60s are most likely, while those in their 20s are least likely.









- 30 -

#### CYCLISTS: EXPERIENCE ON THE ROAD

Figure 12.

Frequent riders are more likely to anticipate driver behavior and to wear bright clothing while they ride.

• Men are significantly more likely to say they anticipate driver behavior while they ride than women.



Daily cyclists are most likely to say they see drivers engaging in dangerous behavior, while monthly cyclists are most likely to say they see other bicyclists breaking traffic rules. These differences are likely due to the frequency of these two groups' rides and the fact that monthly cyclists spend significantly more time driving than riding.

- The youngest and oldest cyclists those in their 20s and those 60+ were significantly more likely to say they always see drivers engaged in dangerous behavior.
- Men and women are equally likely to report that bicyclists and drivers break rules or engage in dangerous behavior.





#### CYCLISTS: SAFETY

Somewhat surprisingly, there is very little difference between daily, weekly and monthly cyclists in terms of how often they feel safe while riding a bike.

- Only a very small percentage of riders always or never feel safe while riding; most feel safe frequently or sometimes.
- There are no significant differences in the feeling of safety by gender, age or city/suburban/rural or by cycling frequency despite some significant difference in riding behavior and rule-following by different segments.
- Cyclists who indicated they never wear a helmet were significantly more likely to indicate they always or frequently feel safe while riding, than reported by all other cyclists, including those who always follow all safety rules.





#### CYCLISTS: MOTORIST ENCOUNTERS

Perhaps unsurprisingly, daily and weekly riders are significantly more likely to report encountering problems while riding than are monthly riders. Similarly, daily riders are significantly more likely to report these problems than are weekly riders.

- Distracted drivers, illegal parking and following too closely are all significantly more likely to impact those living in the city and suburbs than those in rural areas. All the other problems are reported almost evenly across those locations.
- Women riders were significantly less likely than men to report encountering verbal abuse and to have drivers pass too closely.
- Additionally, women were significantly more likely than men to report drivers following too closely.

Figure 15.





#### MOTORISTS: CYCLIST ENCOUNTERS

Grand Rapids motorists encounter cyclists on a regular basis. More than half of respondents – 54 percent – say they encounter a bicyclist always or frequently while driving. None of the respondents said they never encounter a cyclist while driving.

- Women are more likely to say they frequently encounter bicyclists, while men were more likely to say they rarely encounter them while driving.
- Motorists over the age of 50 were more likely to say they encountered cyclists while they were driving than were other age groups.

Figure 16.





#### MOTORISTS: CYCLIST ENCOUNTERS

Among possible problems they may encounter with bicyclists, motorists are most likely to indicate cyclists not wearing bright or visible clothing or not obeying traffic signals and stop signs.

- Drivers living in the city are significantly more likely to encounter cyclists riding against traffic than are those living in the suburbs or rural areas.
- Women are significantly more likely to say they encounter cyclists not wearing bright clothing, while men are significantly more likely than women to say they encounter riders not obeying traffic signals and stop signs and riding against traffic.

Figure 17.

# What problems, if any, do you encounter with people bicycling?



#### **MESSAGE TESTING**

The second half of the survey presented respondents with a variety of messages – both written and visual – to gauge clarity, believability, interest, appeal and likelihood to change behavior. Understanding which messages are likely to prompt behavior change, rather than just determining which ones are popular, is key to building a messaging campaign that achieves the goals of reduced bicycle/motor vehicle crashes and fatalities and builds mutual respect among road users.

#### MINDSET

Understanding how different people view the root of the problem is key to explaining why different audiences favor different message approaches. Frequent cyclists believe that motorists' behavior or lack of knowledge is most likely to contribute to a bicycle/motor vehicle crash. Motorists believe the opposite; that poor behavior and lack of knowledge of the rules among cyclists is most likely to contribute to a crash.

	Please rank the following as most likely to least likely to contribute to bicycle/motor vehicle crashes							
		Daily Cyclists	Weekly Cyclists	Monthly Cyclists	Motorists			
Rank	1	Motorist demonstrating bad driving behavior	Motorist demonstrating bad driving behavior	Motorist not aware of bicyclist rights	Bicyclists breaking the rules, demonstrating bad riding behavior			
	2	Motorist not aware of bicyclist rights	Motorist not aware of bicyclist rights	Bicyclists breaking the rules, demonstrating bad riding behavior	Bicyclist knowledge of proper riding rules			
	3	Lack of mutual respect for one another	Bicyclists breaking the rules, demonstrating bad riding behavior	Motorist demonstrating bad driving behavior	Motorist not aware of bicyclist rights			
	4	Bicyclists breaking the rules, demonstrating bad riding behavior	Lack of mutual respect for one another	Lack of mutual respect for one another	Lack of mutual respect for one another			
	5	Bicyclist knowledge of proper riding rules	Bicyclist knowledge of proper riding rules	Bicyclist knowledge of proper riding rules	Motorist demonstrating bad driving behavior			

Table 6.

Note: responses are color-coded for comparison of rankings.
#### **MESSAGING**

Both cyclists and motorists were asked to rank a set of written messages from most likely to least likely to reduce bicycle/motor vehicle crashes. Respondents then were asked which message from the previous list was most likely to get them to change their riding or driving behavior. There were a few very significant differences between messages that respondents viewed as most likely to reduce crashes and those that would change their own behavior.

- "Share the road" ranked in the top three for both motorists and cyclists in reducing crashes but came in last and second to last in messages that would motivate change in current respondent behavior.
- Cyclists did not think the message of "80% of cyclists are killed by their own behavior" would reduce crashes, likely because cyclists tend to view crashes as resulting from driver poor behavior, but it was the top message in motivating change in respondents' behavior even if they did not believe the figure to be accurate. It is important to note that this statistic was fabricated to investigate cyclists' attitudes.
- Somewhat similarly, motorists ranked "Respect everyone's journey" last in reducing crashes but third in motivating respondents to change their driving behavior. Respondents like the reminder to be respectful and the inclusiveness of "everyone," which many viewed as including other drivers as well as cyclists/pedestrian interactions.
- The top response for motorists was "None" that no message was going to change their behavior while "None" was ranked fourth for behavior change for cyclists. Answers imply that it will be more difficult to change behavior of drivers than of cyclists.
- One message did rank well for both groups on both questions: "Drive or ride. Same rights. Same rules."

Cyclists						
Which message is most likely (1) to least likely (8) to reduce bicycle/motor vehicle crashes?	Which statement is most likely to get you to change your riding behavior?					
<ol> <li>Drive or ride. Same rights. Same rules.</li> <li>Share the road</li> <li>Expect the unexpected</li> <li>Watch out for specific driver behavior (i.e. turning and opening doors)</li> <li>Respect everyone's journey</li> <li>Specific tips for bicycle safety (i.e. ride with traffic not against it, use lights at night)</li> <li>We are enforcing bicycle laws to keep our streets safe</li> <li>80% of cyclists are killed by their own behavior*</li> </ol>	<ol> <li>80% of cyclists are killed by their own behavior*</li> <li>Drive or ride. Same rights. Same rules.</li> <li>Expect the unexpected</li> <li>None</li> <li>Respect everyone's journey</li> <li>Watch out for specific driver behavior (i.e. turning and opening doors)</li> <li>Specific tips for bicycle safety (i.e. ride with traffic not against it, use lights at night)</li> <li>Share the road</li> <li>We are enforcing bicycle laws to keep our streets safe</li> </ol>					
Moto	prists					
Which message is most likely (1) to least likely (9) to reduce bicycle/motor vehicle crashes?	Which statement is most likely to get you to change your driving behavior?					
<ol> <li>Specific tips for bicycle safety (i.e. ride with traffic not against it, use lights at night)</li> <li>Drive or ride. Same rights. Same rules.</li> <li>Share the road</li> <li>Look out for cyclists</li> <li>Bike lanes will reduce bicycle crashes and fatalities</li> <li>Stay wider of the rider</li> <li>Respect everyone's journey</li> <li>Cars and bicycles have equal rights to the road</li> <li>Don't kill a cyclist bicyclists are vulnerable</li> </ol>	<ol> <li>None</li> <li>Drive or ride. Same rights. Same rules.</li> <li>Respect everyone's journey</li> <li>Specific tips for bicycle safety (i.e. ride with traffic not against it, use lights at night)</li> <li>Bike lanes will reduce bicycle crashes and fatalities</li> <li>Look out for cyclists</li> <li>Cars and bicycles have equal rights to the road</li> <li>Don't kill a cyclist, bicyclists are vulnerable</li> <li>Stay wider of the rider</li> </ol>					

Table 7.

\*Specifically refers to children 14 years old and younger. About 50 percent of adult cyclists are found to be at fault for a crash involving a motor vehicle. The higher statistic was included to test reaction and preferences of cyclists

#### **CREATIVE TESTING**

- Messages from around the United States and from other countries were used to test responses to existing types of ads.
- Messages were categorized into three thematic areas observed through best practice research Instructional, Mutual
- Respect and Humanizing messages.

#### INSTRUCTIONAL CREATIVE

Three instructional ads were tested – two focusing on distance that motorists should give cyclists while passing them on the roadway and a third image instructing cyclists to stopping at red lights.

- Cyclists overwhelmingly selected the messages about drivers staying farther away while passing: 86 percent of cyclists chose either "Stay wider of the rider." or "Maintain 3FT When Passing Bicyclists."
- Motorists favored the "Cyclists. Always Stop at Red Lights." message most often; 46 percent of those respondents selected it as most appealing.
- Motorists under the age of 30 favored the "Maintain 3FT" message over the "Red Lights" message; this was the only age group of motorists to do so.

Figure 18.





Which of the above messages is most appealing to you?

#### MUTUAL RESPECT CREATIVE

Six mutual respect ads, with a variety of approaches, were tested. The direct "Share the Road" messages were not appealing to respondents, with the exception of "Don't Compete. Share the Street." The latter was more roundly supported because it included pedestrians and rhymed.

- The message "Same Road. Same Rules." was the most appealing to all respondents regardless of cycling frequency, age, gender or location of residence.
- Respondents favored the "Same Road. Same Rules." message largely because they felt it speaks to both motorists and cyclists reminding cyclists to follow the rules and motorists that cyclists are allowed on the road.
- Women were significantly more likely than men to find "Don't Compete. Share the Street." appealing.
- "Don't Compete. Share the Street." was significantly more appealing to those 50+ years of age than to respondents younger than 50. "Life Has Enough Problems" had the opposite effect, appealing more to respondents 20–49 years old than to respondents over 50 years old.

Figure 19.





#### Which of the above messages is most appealing to you?

45

#### HUMANIZING CREATIVE

Three humanizing messages were presented – ads intended to emphasize that cyclists are people, perhaps people that you know, in order to combat the animosity that appears between cyclists and motorists. Two of the three ads split respondents, while the third option came in a very distant third place.

- A majority of weekly and monthly cyclists found "Bicycles don't come with bumpers." most appealing. None of the ads gathered a majority of daily cyclists, but this one did lead, with 48 percent of daily cycling respondents finding it most appealing.
- A slim majority of motorists responded best to "See the Person. Share the Road."
- Motorists were more apt to find the "Bicycles don't come with bumpers." message overly dramatic and often felt that they were being blamed for all accidents.
- Women preferred the "Bicycles don't come with bumpers." message more than men did 56 percent to 47 percent.
- Preferences among respondents over the age of 50 differed significantly from those of younger respondents. Forty-eight percent of the older group found the "See the Person. Share the Road." message most appealing, while only 32 percent of those under 50 did.
- Respondents in their 20s were significantly more likely than all older age groups to find "Bicycles don't come with bumpers." most appealing, with 63 percent doing so.

Figure 20.



Which of the above messages is most appealing to you?



#### **OVERALL CREATIVE**

Last, we asked respondents to review all of the ads they had viewed and select which one was most appealing overall. Two messages rose to the top for all groups: "Same Road. Same Rules." and "Bicycles don't come with bumpers." Additionally, two of the instructional messages ranked in the top three. Cyclists preferred the "Maintain 3FT When Passing Bicyclists" message, and motorists preferred "Cyclists. Always Stop At Red Lights." Motorists prefer the message telling cyclists what action to take, while cyclists like the message telling motorists what action to take. Both groups say that the behavior addressed in their chosen ad – cyclists not stopping at red lights; motorists passing too closely – is one of the biggest problems they encounter as motorists or cyclists, respectively.

Table	8.				
	Daily Cyclists	Weekly Cyclists	Monthly Cyclists	Motorists	
1	Maintain 3FT When Passing Bicyclists	Maintain 3FT When Passing Bicyclists	Bicycles don't come with bumpers.	Same Road. Same Rules.	
2	Bicycles don't come with bumpers.	Same Road. Same Rules.	Same Road. Same Rules.	Cyclists. Always Stop At Red Lights.	
3	Same Road. Same Rules.	Bicycles don't come with bumpers.	Maintain 3FT When Passing Bicyclists	Bicycles don't come with bumpers.	

Note: responses are color-coded for comparison of rankings.

A complete finding of overall ad preference by cycling frequency appears below. A few outliers, which did not fall in the top three ads, are readily visible; motorists' preference for "Don't Compete. Share the Street." and daily cyclists' preference for "Don't Be a Hothead." are clearly seen.



Figure 21.

## Of all of the ads you have viewed, which one is the most appealing overall to you?

This page intentionally left blank.

### APPENDIX B: MEDIA CAMPAIGN SCAN

#### **OVERVIEW**

The safety education media campaign scan identified and audited existing bicycle safety awareness and education campaigns. Examples were gathered from the US and abroad to inform message and media recommendations.

#### DATABASE DEVELOPMENT

The team developed a database of existing campaigns, populated by conducting the broadest possible scan of traffic safety campaign types and campaign goals. The callout box below identifies pieces of information collected gathered per campaign:

#### MAIN FINDINGS

The campaign scan's main findings are divided into three broad sections according to:

- Audience
- Objective
- Tone

Each of these sections communicates different implications for the next phase of the Bicycle Safety Education Project. The callout box on the facing page identifies ways in which the project team has used campaign scan findings to make choices about the project's development.

### Information Sought Per Campaign Example:

- Name
- Lead/Partners
- Description
- Primary Campaign Message
- Tone of Message
- Materials/Samples (saved as a URL or an image)
- Delivery Method (i.e.- TV placement poster)
- Campaign Timing (order of segment, time of year)
- Language (i.e.- dual/multilingual)
- Target Crash Factor
- Target Audience (age, race, gender
- Evidence of Effectiveness
- Link



Analyzing existing media campaigns, such as this example from the City of Sydney and creative agency Frost\*, helped identify campaign tropes common to multiple examples.

## **Campaign Scan Findings & Project Implications:**

#### Audience

Campaign Scan Examples		Project Implications				
•	People who bike People who drive Both cyclists and motorists "Community at-large"	The Steering Committee decided to focus on a target audience of people who bike and people who drive.				

#### Objective

Campaign Scan Examples	Project Implications
<ul> <li>Awareness of pedes- trians'/bicyclists' vulnerability</li> <li>Enforcement</li> <li>Yield to people crossing the street</li> <li>Practice safe bicycling</li> </ul>	The project focuses on three main objectives: 1) Provide education and training on the operation of a bicycle in traffic; 2) Increase the knowledge of the respon- sibilities of bicyclists and motorists; 3) Promote a "share the road" culture.

#### Tone

Campaign Scan Examples	Project Implications		
<ul> <li>Humor</li> <li>Empathy</li> <li>Fear-based/Shocking</li> </ul>	<ul> <li>The online and in-person focus groups were designed to test the target audiences' reactions to specific tones.</li> <li>The Steering Committee decided not to pursue creative pieces that employ a 'shocking' tone.</li> </ul>		

# Campaign Scan Database by the Numbers:

61 Media campaigns contained within the final database

**100** Media pieces reviewed (i.e.- posters, TV public service announcements, radio placements)

**13** Campaign metrics reviewed per media piece

#### Sample Media Campaigns Photo Inventory

The following sample media pieces illustrate a variety of target audiences, objectives, and tones found throughout the overall campaign scan review.

Target Audience Examples

#### Media Pieces Targeting People Who Bike



#### Media Pieces Targeting People Who Drive



Media Pieces Targeting People Who Bike and People Who Drive



- 48 -

Media Pieces Targeting the Entire Community



49

Examples of Campaign Objectives

Yield to People Crossing the Street





- 50 -

**Practice Safe Bicycling** 



**Practice Safe Driving** 



Enforcement





- 53 -

Campaign Tone Examples

Empathy



Educational/Authoritative



Fear-based/Empathy



At 35mph you are twice as likely to kill someone as you are at 30mph.





#### Shock/Fear-based



Humor

## KEEP A LONG DISTANCE RELATIONSHIP.



TACOMA.



Mitean A



Albertan Government

Keep your eyes off your phone. crotcheskill.ca

This page intentionally left blank.

### APPENDIX C: CRASH ANALYSIS REPORT

#### **OVERVIEW**

This memo presents the results of an analysis on bicycle involved crashes in the Grand Rapids region. It uses the most recent ten years for which data are available (2004-2013) to identify trends and answer questions regarding the 'who, what, where, when, why and how' of bicycle crashes. The memo presents a series of figures under each of the category headers. The final report will contain maps illustrating crash trends. The team will append the report upon the maps' completion.

Grand Rapids has one of the worst bicycle-related crash rates in Michigan. Table 9, below, compares the Greater Grand Rapids area data to state averages: Statistics contained in this report originated from police reports filed through the Michigan Traffic Crash Facts database. Crashes within the study area reflect the national phenomenon of under-reported bicycle crashes. Although the report reflects the most accurate and most up-to-date information available, the dataset can only contain crashes that are reported to the police. The level of underreporting within the study area is unknown. Studies in other communities reveal that as many as 90% of crashes with injuries on private roadways are unreported.

Table 9. Grand Rapids Area Crashes Compared with Michigan Averages

	Grand Region (2008-2012)	City of Grand Rapids (2008-2012)	Michigan Average (2008-2012)
Bike crashes as percent of total crashes	0.9%	1.2%	0.7%
Percent of bike crashes that are fatal	4.2%	8.2%	2.8%
Percent of bike crashes with incapacitating injuries	4.0%	1.9%	3.5%

The results of this analysis will inform the development of messaging campaigns designed to improve bicycle safety. These campaigns will be responsive addressing the trends in bicycle crashes identified in this memo. Key findings are provided in the following section. The findings will help inform the safety messaging developed during subsequent phases.

#### **KEY FINDINGS**

#### What

- Bicyclists are 7 times more likely than drivers to be injured in a bike-vehicle crash (99% vs 14%).
- Over 96% of crashes involve passenger cars/station wagons, pickups and vans/motorhomes.







#### Who

- Youth (10-19) and young adults (20-24) are overrepresented as bicyclists in crashes, as compared to their share of the general population. Males are over-represented, representing 80% of crashes.
- Driver age patterns are reflective of the general population. Males are slightly over-represented, representing 53.5% of crashes







#### When

- Crash data indicates a small morning peak period around 7 am and a much longer evening peak period from approximately 3-7 pm. School age children (0-17) make up a relatively larger portion of bicycle crashes occurring during the afternoon peak period, beginning when school lets out in the afternoon.
- Crashes are more common during the warmer summer months, likely reflecting higher ridership during these months.
- Crashes are more common during the week, perhaps indicative of more weekday riding. Roads also carry higher weekday traffic volumes, particularly during peak periods, when many crashes occur.
- 80% of crashes take place during daylight hours. The share of crashes occurring under dark, dusk, or dawn conditions is higher during the winter months when days are shorter.

#### Where

- Crashes appear to be concentrated on a number of high crash corridors.
- The top twenty streets with the most crashes represent 40% of all crashes recorded throughout the study area (Table 9).

Street	Grand Rapids	Wyoming	Walker	Kentwood	Grandville	East Grand	Plainfield Township	Grand Rapids	Alpine Township	Total
						Rapids		Township		
Division	50	18		8	1					77
Fulton	51							1		52
Leonard	49		3							52
44th	6	18		14	6					44
28th	13	23		2	3					41
Kalamazoo	21			12						33
Burton	28	1		3						32
Eastern	21			9						30
36th	1	26			2					29
Lake	16					12				28
Wealthy	19					8				27
Clyde Park	5	20								25
Hall	17					7				24
Michigan	22									22
Plainfield	14						7			21
Lafayette	20									20
Alpine	9		8						2	19
Cherry	19									19
Fuller	19									19
L. Michigan	16		3							19
Top 20 Subtotal	416	106	14	48	12	27	7	1	2	633
All Others	545	176	32	105	36	32	35	14	5	980
Total	961	282	46	153	48	59	42	15	7	1,613
% Crashes on top 20 streets	43%	38%	30%	31%	25%	46%	17%	7%	29%	39%

Table 9. Top Twenty High Crash Corridors

#### Arterial streets:

- Nearly 60% of crashes took place on an arterial roadway (or at an intersection that included an arterial roadway), though arterials represent only 17% of the roadway miles in the region.
- Approximately half of bicycle crashes on arterial streets take place at traffic signals.
- Local streets represent over 60% of the roadway miles in the region, but only 26% of crashes.

Functional Class	Percent of Crashes	Roadway Miles	Percent of Roadway Miles
Interstate/ Freeway	1.8%	279	7.4%
Arterial	57.9%	638	17.1%
Collector	12.8%	533	14.2%
Local	26.2%	2,294	61.3%
No Functional Class *	1.2%		
Total	100%	3,744	100%

Table 10. Functional Class and Crashes

#### Intersections and traffic signals:

- Over 60% of bicycle crashes occur within an intersection or are intersection related. Nearly all crashes at intersections took place at or near a signalized or stop controlled intersection.
- At traffic signals, over 40% of crashes involved a right turning vehicle, approximately 15% involved a left turning vehicle, and 28% involved a vehicle going straight.
- More than half of crashes on local streets took place at stop signs.
- At stop signs, nearly half of crashes involved a vehicle going straight, followed by left turning and then right turning vehicles.

#### Driveways:

• 17% of bicycle crashes are driveway related.

\*654 miles of roadway classified as 'unknown' in the roadway file and are not included in the mileage calculation.



Figure 26. Bicycle Crashes According to Frequency: 2004-2013

- 66 -

Figure 27. Bicycle Crash Severity in the Greater Grand Rapids Area: 2004-2013



- 67 -



Figure 28. Frequency of Bicycle Crashes within 1/4 Mile and 1/2 Mile of Grand Rapids Schools

- 68 -



Figure 29. Severity of Bicycle Crashes within 1/4 Mile and 1/2 Mile of Grand Rapids Schools

#### How

- Right and left turning movements are prominent vehicle actions
- Twice as many crashes involved right turning vehicles (25% of all crashes) as compared to left turning vehicles (12% of all crashes). Over 35% of crashes involved vehicles traveling straight.
- The majority of crashes involve the bicyclist going straight, followed by crossing at an intersection (there appears to be overlap in these two categories, as both actions can be found in intersection crash records). Very few crashes involve turning bicyclists.







#### Why

- The bike failed to yield in 20% of reported crashes and disregarded the traffic control in 6.5% of crashes. Approximately 60% of crashes have a recorded hazardous bicycle action of 'none' or 'other'.
- The vehicle failed to yield in nearly 30% of bicycle crashes. The vehicle hazardous action was recorded as 'none' in just over 50% of crashes.

#### Figure 32. Bike Hazardous Action





#### Figure 33. Vehicle Hazardous Action

## RIDERSHIP INFORMATION: STATEWIDE AND LOCAL DATA

Understanding the number of bicyclists in a given place helps give meaning to crash statistics. The information helps interpret the relative risk of bicycle crashes. Previous efforts have attempted to understand Grand Rapids' level of bicycle ridership. There is significantly less information available for surrounding communities. Census data for "means to work" for the City of Grand Rapids from 2006-2013 shows an average 0.9% mode share for bicycling. The total number of riders counted during annual bicycle counts within Grand Rapids has increased by 60% from 2011 to 2013. Additionally, 56% of adult respondents to the 2013 MDOT Household Survey on Bicycling reported having ridden a bicycle within the past year. Continuing to collect ridership estimates over time across the city and region will add more certainty to available exposure and risk data.



Ridership across Michigan increases every year (Source: https://mackinacbridgerun.files. wordpress.com/2012/06/michigander-blog-post-pic.jpg).
# LAW ENFORCEMENT OFFICER SURVEY DATA

Surveying law enforcement officers and conducting an online focus group helped fill in data missing from the crash study. This qualitative data helped understand law enforcement officers' opinions of area traffic safety awareness. Surveying the public helped test media campaign materials and gauge public understanding of traffic safety issues.

Surveyed law enforcement officers represented all four service areas within Grand Rapids. Officers in the study area's surrounding communities also contributed opinions.

The majority of surveyed officers do not ride bicycles when on-duty or during their free time.

The majority of officers did not feel that their service area was more affected by poor bicyclist-motorist interaction than other areas of Grand Rapids.

Officers outside of Grand Rapids believed that their respective service areas were more affected by these problems than other service areas (Figure 34).

The figures on the following page (Figure 35, Figure 36) describe differences in offenses for which motorists and bicyclists are cited. Disregard of traffic signs and signals represents the most common infraction for both motorists and bicyclists. Speeding, nationally recognized as a major killer of people biking and walking, is the second-most commonly cited infraction against people driving. Lack of proper safety equipment (i.e.-lights at night) and failure to yield are the second-most prevalent bicyclist infractions.







### From the Crash Data:

- The bike failed to yield in 20% of reported crashes and disregarded the traffic control in 6.5% of crashes. Approximately 60% of crashes have a recorded hazardous bicycle action of 'none' or 'other'.
- The vehicle failed to yield in nearly 30% of bicycle crashes. The vehicle hazardous action was recorded as 'none' in just over 50% of crashes.

#### Figure 36.



— 74 —



When asked about issues related to traffic safety, both surveys demonstrated an onus placed upon people riding bicycles. In the Greater Grand Rapids communities' "lack of mutual respect" was cited as the second-most important category (Figure 37).

#### Messaging

The law enforcement officers' top five answers to the survey question, "What specific messages should be conveyed through a media campaign to reduce bicycle crashes?" are displayed below (Figure 38). The message that officers ranked "very important" most often was, "Both bicyclists and motorists have a responsibility" followed by, "Educate people biking about specific behavior to protect themselves". Law enforcement officers expressed concern about a lack of bicycle riders' visibility and a need for messaging concerning legal/safe riding behavior. When asked to comment on an important message for motorists, officers commented about a need for motorists to pay extra attention for people bicycling and to give them space when passing. Officers' diverse opinions and perceptions concerning bicycle-specific infrastructure may mirror the general public's opinions and perceptions. While some officers support separated infrastructure for people driving and biking, others do not see the value in their construction.



#### Figure 38.

This page intentionally left blank.

## APPENDIX D: COUNTERMEASURE IDENTIFICATION

#### **OVERVIEW**

The crash analysis report informed an understanding of common Grand Rapids area crash factors. Identifying key infrastructure and non-infrastructure countermeasures helps to create a list of resources that communities can apply to particular high-crash areas.

As with any intersection or corridor analysis, more detailed engineering analysis is needed to select and design physical countermeasures for a specific location. Nonetheless, this chapter will guide communities to design guidance for specific countermeasures featured within national and local design resources.

Non-infrastructure countermeasures are analyzed after the discussion of physical infrastructure.

## Using This Chapter-Crash Types:

Crash data analysis for the Greater Grand Rapids area identified the most common behaviors involved in roadway crashes for people who ride bicycles. These crash types are represented below.



## Using This Chapter-Countermeasures

Recommended physical infrastructure countermeasures were drawn from the Federal Highways Administration's *Crash Modification Factor Clearinghouse* as well as other research study recommendations. The recommended countermeasures are listed by crash types.



Suggested countermeasures originated from e Federal Highway Administration (FHWA) *Bicy e Countermeasure Selection System (BIKESAFE)* and the FHWA *Crash Modification Factors Clearinghouse.* 

#### Table 11. Countermeasure Identification: Addressing Common Crash Factors

					Crash Types	5				
		Motorist Failure to Yield	Motorist Turned into the Path of a Bicyclist	Vehicle Speed	Bicyclist Failure to Yield- Signalized Intersections	Sidewalk Riding	Signalized Intersection- Arterial	Signalized Intersection- Local Street, Stop Sign	Driveway	"Dooring" Type Crash
	Implement access management	x (driveway scenario)	x (driveway scenario)						х	
	Improve driveway intersections	х	x (driveway scenarios)						х	
Ľ	Traffic calming	х		x	х	х		х		
	Right and left motor vehicle turn consider- ations (such as RTOR and turn lane design)	х	x		х		х	х	х	
	Improve intersection geometry	х	х		х		х	х	х	
	Improve signal timing and detection		х		х		х			
	Improve visibility at intersection		х		х	x	х	х	х	
1	Pedestrian countdown/ signal		х				х			
	Bicycle boulevard (AKA neighborhood greenway)	х		x	х	х		х		
	Shared roadway	х		х	х	х		х		
	Bicycle lane	х			х	х		х	х	x (or wider car parking lane)
	Separated bicycle lane 'buffer- or barrier- orotected bike lane, AKA cycle track)		x	x	x	x	x (with appropriate intersection trweatments)		x (with appro- priate inter- section treatments)	х
	Sidepath/shared-use path	х	х		х	х			х	х
-	Through bike lanes/inter- section markings	х	х		х	х	х		х	
	Bicycle detection				х	х	х			
	Bike box	x	x		х		х			
	Left-turn queue box		х		х		х			
	Dedicated bike signals, leading bicycle intervals, 'green wave"				х		x			
	Shoulder bicycle lane		х			х				

#### Table 12. Countermeasure Identification: Design Guidance

Crash Types							
	AASHTO Guide for the Development of Bicycle Facilities, 4th Edition (2012)	Best Design Practices for Walking and Bicycling in Michigan	BIKESAFE Crash Type Matrix	"How to Create a Bicycle Safety Action Plan: On- read Bicycle Facilities", PBIC Webinar. 10/16/14	NACTO Urban Bikeway Design Guide, 2nd Ed.	NCHRP Report 500, Vol. 18: A Guide for Reducing Collisions Involving Bicycles	MMUTCD
Implement access management	"Other crashes at driveways" (p. 3-2),	N/A	N/A	N/A	N/A	Limiting number of driveways; providing for right-in, right-out only movements; locating signals to favor through movements; restricting turns at certain inter- sections; ; using non- traversable medians for left- and U-turn management (pg. V-79)	N/A
Improve driveway intersections	Mentioned with regards to various types of bicycle lane designs	"Left side bike lane" (pg. 46)	Intersection markings	N/A	Intersection crossing mark- ings (pg. 55-60), cycle track (pg. 388-39)	Tighter turn radii at drive- ways; at- grade walkways to show bike/ ped right-of- way; debris removal to avoid obscured visibility; bicycle- specific pavement markings (pg. V-76)	Section 9B.03- STOP and YIELD signs (R1- 1, R1-2)
Traffic calming	"Bicycles and traffic calming" (pg. 4-51 - 4-53); "Retrofitting bicycle facili- ties without roadway widening" (note: this section discusses lane reallocation, AKA 'road diets' (pg. 4- 29 - 4-33)	"Bulb outs" (pg. 17), "Road diet" (pg. 36)	Speed tables/ humps/ cushions; mini traffic circles; chicanes; visual narrowing	Mini traffic circles (slide 53)	Speed manage- ment in bike boulevard design (pg. 167- 177); volume management in bike boulevard design (pg. 177-185)	Objective C- Reduce motor vehicle speeds (V-73 - V-75)	Chapter 4E: Pedestrian control features; Chapter 4F: Pedestrian hybrid beacons, Chapter 5H: Traffic control for school areas, Part 7: Traffic control for school areas

Crash Types							
	AASHTO Guide for the Development of Bicycle Facilities, 4th Edition (2012)	Best Design Practices for Walking and Bicycling in Michigan	BIKESAFE Crash Type Matrix	"How to Create a Bicycle Safety Action Plan: On- read Bicycle Facilities", PBIC Webinar. 10/16/14	NACTO Urban Bikeway Design Guide, 2nd Ed.	NCHRP Report 500, Vol. 18: A Guide for Reducing Collisions Involving Bicycles	MMUTCD
Right and left motor vehicle turn consider- ations (such as RTOR and turn lane design)	"Right turn considerations" (note: although relevant, this section does not discuss RTOR) (pg.4-23 - 4-25); "Left turn consider- ations" (pg. 4-26 -4-27); turns and freeway interchanges (pg. 4- 57)	"Prohibited left turns (Michigan Left)" (pg. 13); "Prohibited right turns on red" (pg. 14)	Turning restrictions	"Right hook countermea- sure" (slides 56-59)	Turning radii: (http://nacto. org/us dg/inter- section- design- elements/ corner- radii/); other sections mention restricting RTOR when installing cycle track and other separated facilities	"Exhibit V-21- Strategy attributes for improving pave- ment markings at intersections" (pg. V-32)	Section 2B.54 No turn on red signs (R10-11 Series, R10- 17a, and R10-30)
Improve intersection geometry	N/A	"Combined bike/turn lane" (pg. 23)	N/A	N/A	Combined bike/ turn lane (pg. 79)	Reduce crossing distance; realign intersection approaches to reduce or eliminate intersection skew; modify geometry to facilitate bicycle movement at interchange on-ramps and off- ramps; provide refuge islands and raised medians (pg. V-34)	N/A
Improve signal timing and detection	"Traffic signals" (pg. 4-43); "Detection for bicyclists at traffic signals (pg. 4- 47)	"Pedestrian countdown signal" (pg. 8); "Leading pedes- trian interval" (pg. 9)	Bicycle signal heads; install/ optimize timing	Signal timing practices (slide 62)	bicycle signal head (pg. 93-99); bicycle detection (pg. 99- 105)	"Strategy A2: Improve signal timing and detection" (pg. V-9)	Chapter 4B: Traffic control signals- general; Chapter 4C: Traffic control signal needs studies; Chapter 4D: Traffic control signal features; Chapter 9D: Signals (Part 9- Traffic control for bicycle facilities)

Crash Types							
	AASHTO Guide for the Development of Bicycle Facilities, 4th Edition (2012)	Best Design Practices for Walking and Bicycling in Michigan	BIKESAFE Crash Type Matrix	"How to Create a Bicycle Safety Action Plan: On- read Bicycle Facilities", PBIC Webinar. 10/16/14	NACTO Urban Bikeway Design Guide, 2nd Ed.	NCHRP Report 500, Vol. 18: A Guide for Reducing Collisions Involving Bicycles	MMUTCD
Improve visibility at intersection	"Bicycle lanes at intersections" (pg. 4- 22)	See: "Signalized intersection improvements" table (pg. 5)	Intersection marking; sight distance improvements; roundabouts; turning restric- tions; sight distance improvements	See discussion on bike boxes (slide 62)	Intersections Chapter discusses a variety of tools for increased visibility and predictability: (pg. 47-90)	"Objective A"- Reduce bicycle crashes at intersections (pg. V-7)	Section 9B.05- BEGIN RIGHT TURN LANE YIELD TO BIKES sign (R4-4); Section 9B.16- Intersection warning signs (W2 Series); Section 9B.18- Bicycle warning and combined bicycle/pedes- trian signs (W11-1 and W11-15)
Pedestrian countdown/ signal	N/A	"Pedestrian countdown signal" (pg. 8)	N/A	N/A	N/A	N/A	See column entitled, "Improve signal timing and detection"
Bicycle boulevard (AKA neighborhood greenway)	Bicycle boule- vard treatments to lower speeds and divert through motor traffic (p. 4-33),	The refer- ence contains a number of applications suitable for use within neighborhood greenways such as bulb-outs or marked crosswalks	The BIKESAFE Matrix devotes a column to traffic calming measures.	"Bike boule- vards" (slide 54)	Bicycle Boulevard Chapter (pg. 145- 214)	"Exhibit V-11 Strategy attributes for improving signage" (pg. V-19); "Objective C- Reduce motor vehicle speeds" (V-73 - V-75)	N/A
Shared roadway	"Shared lanes" (pg. 4-1); "Shared lanes on major road- ways (wide curb/outside lane)" (pg. 4-3); "Signs for shared road- ways" (pg. 4-3); "Marked shared lanes" (pg. 4-4)	"Shared lane markings" (pg. 42)	Reduce lane number; lighting improvements; reduce lane width; reduce lane number; reduce lane width; median/ crossing island	"Wrong way riding counter- measures" (see: shared lane markings) (slide 34)	Shared lane markings (pg. 133- 139)	"Shared lane marking' (pg. V-52)	Section 9B.06- Bicycle may use full lane sign (R4-11)
Bicycle lane	Multiple catego- ries: (pg. 4-11 - 4-27); three sections on retrofitting facilities (pg. 4-28 - 4-32)	"Bike lane" (pg. 41); "Colored bike lane" (pg. 43); "Contra- flow bike lane" (pg. 45); 'Left side bike lane" (pg. 46)	The BIKESAFE Matrix devotes a column to on-road bike facilities.	"Contra-flow bike lanes" (slide 36); "Sidewalk riding counter- measures" (slide 39); "Struck from behind countermea- sures" (slide 44)	Bike lanes (pg. 1-26)	"Bicycle lane striping" (pg. V-50 - V-51)	Section 9B.04- Bike lane signs and plaques (R3-17, R3- 17a, R3-17bP); Section 9C.04- Markings for bicycle lanes

Crash Types							
	AASHTO Guide for the Development of Bicycle Facilities, 4th Edition (2012)	Best Design Practices for Walking and Bicycling in Michigan	BIKESAFE Crash Type Matrix	"How to Create a Bicycle Safety Action Plan: On- read Bicycle Facilities", PBIC Webinar. 10/16/14	NACTO Urban Bikeway Design Guide, 2nd Ed.	NCHRP Report 500, Vol. 18: A Guide for Reducing Collisions Involving Bicycles	MMUTCD
Separated bicycle lane (buffer- or barrier- protected bike lane, AKA cycle track)	N/A	"Buffered bike lane" (pg. 43); "Cycle track" (pg. 47)	Separated facilities are included under the BIKESAFE matrix entitled, "On-road bike facilities"	"Buffered bike lanes" (slide 42); "Struck from behind counter- measures" (slide 44)	Cycle tracks (pg. 27- 46); buff- ered bike lanes (pg. 9-14)	N/A	N/A
Sidepath/shared-use path	Chapter 5: Design of shared-use paths	N/A	Path intersec- tion treatments	Struck from behind counter- measures (slide 44)	N/A	Various guid- ance in Section V: Description of strategies	Section 9B.12- Shared-use path restriction sign (R9- 7); Section 9C.03- Marking patterns and colors on shared-use paths; Section 9C.07- Shared lane marking
Through bike lanes/inter- section markings	Numerous references. See: pg. 4-22, 5-11, 5-30, 5- 33	C rossing mark- ings- pg. 20	Pavement marking improvements	"Right hook countermea- sure"; and "Right & left hook counter- measures" (slide 57-58)	Intersection crossing markings (pg. 55-60); cycle track intersec- tion approach (85-90)	"Strategy A4: Improve pave- ment markings at intersections" (pg. V- 20)	N/A
Bicycle detection	"Detection for bicycles at traffic signals" (pg. 4-7)	"Bicycle signal detection" (pg. 19)	N/A	N/A	Signal detection and actuation (pg. 99- 104)	"Strategy A2: Improve signal timing and detection" (pg. V-9 - V- 15)	Section 9B.13- Bicycle signal actuation sign (R10- 27); Section 9C.05- Bicycle detection symbol
Bike box	N/A	"Bike box" (pg. 21)	N/A	"Bike box" (slide 62)	Bike boxes (pg. 49- 54)	N/A	N/A
Left-turn queue box	N/A	Two-stage bike left turn (pg. 22)	N/A	N/A	Two-stage turn queue boxes (pg. 61- 66)	N/A	N/A
Dedicated bike signals, leading bicycle intervals, "green wave"	N/A	"Bicycle signals" (pg. 24), "Midblock signal" (pg. 32)	Bicycle signal heads	N/A	Signalization principles: http://nacto. org/us dg/inter- section- design- elements/ traffic- signals/ signalization- principles/	N/A	N/A
Shoulder bicycle lane	Paved shoulders (p. 4-4); paved shoulders (p. 4-7); rumble strips (p. 4- 9)	"Sidewalks and paved shoul- ders" (pg. 36)	Paved shoulders	"Struck from behind counter- measures" (slide 44)	N/A	Bicycle- tolerable shoulder rumble strips (pg. V-70 )	Chapter 3J Rumble strip markings

### **References:**

AASHTO Guide for the Development of Bicycle Facilities, 4th Edition (2012)

https://bookstore.transportation.org/item\_details aspx?ID=1943

Best Design Practices for Walking and Bicycling in Michigan

http://www.michigan.gov/documents/ mdot/MDOT\_Research\_Report\_RC1572\_ Part6\_387521\_7.pdf

BIKESAFE Countermeasure Selection Matrix

http://www.pedbikesafe.org/BIKESAFE/matrix\_ crash.cfm "How to Create a Bicycle Safety Action Plan: On-road Bicycle Facilities

http://www.pedbikeinfo.org/pdf/Webinar\_PBIC\_ LC\_101614\_BSAP.pdf

MMUTCD http://mdotcf.state.mi.us/public/tands/plans.cfm

NACTO Urban Bikeway Design Guide, 2nd Ed. http://nacto.org/cities-for-cycling/design-guide/

NCHRP Report 500, Vol. 18: A Guide for Reducing Collisions Involving Bicycles

http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp\_ rpt\_500v18.pdf

#### NON-INFRASTRUCTURE COUNTERMEASURES

This section focuses on infrastructure countermeasures. Nonetheless, non-infrastructure countermeasures (i.e.- education, encouragement, enforcement) also help prevent bicycle-car crashes.

For additional information, please refer to the other sections included in this report.

#### Examples of Non-Infrastructure Countermeasures

Non-infrastructure countermeasures can help address the following crash types:

#### Table 13. Non-infrastructure Countermeasures

Crash Type	Non-Infrastructure Countermeasures
Motorist failure to yield	<ul> <li>Law enforcement "sting" (i.e crosswalk, safe passing)</li> <li>Media campaign (i.e elements placed in the public way, radio ad, etc)</li> <li>Education within drivers' education, professional driver training, diversion. courses, etc.</li> <li>Mailings sent to licensed motorists, included within utility bills, etc</li> </ul>
Motorist turned into the path of a bicyclist	See: "Motorist failure to yield"
Vehicle speed	Law enforcement stings and similar enforcement measures (i.e speed feedback sign campaign)
Bicyclist failure to yield – Signalized intersection	Media campaign near signalized intersections
Sidewalk riding	<ul> <li>Youth bicycle safety education courses</li> <li>Adult bicycle safety education courses</li> <li>Signage/other media within areas prohibiting sidewalk riding</li> </ul>
Signalized intersection – Arterial	Bicycle safety education courses can teach how to safely bicycle through these locations
Signalized intersection – Local street, stop sign	Bicycle safety education courses can teach how to safely bicycle through these locations
Driveway	Education within drivers' education, professional driver training, diversion courses, etc.
"Dooring"	<ul> <li>Stickers placed on doors within taxis and other vehicles (i.e "LOOK for bicyclists before opening")</li> <li>Mailings sent to licensed motorists, included within utility bills, etc</li> </ul>

This page intentionally left blank.

## APPENDIX E: BICYCLE CODE OF ORDINANCES REVIEW

#### **OVERVIEW**

The study team reviewed bicycle ordinances for each of the nine municipalities included within the greater Grand Rapids area. Reviewing transportationrelated ordinances benefits the study area by auditing the bicycle friendliness of each jurisdiction's rules governing bicycle travel.

Benefits of reviewing existing policy include the following:

- Policy plays a large role in keeping vulnerable road users safe.
- Standardized policy across a region is more userfriendly for bicyclists and law enforcement.
- Standardized policy also allows for more streamlined education and enforcement efforts.

Ideally, the bicycle friendly policy items proposed in this document would be passed across the State of Michigan. Statewide legislation offers even more standardization between jurisdictions. Statewide jurisdiction mandates the passing of bicycle-supporting policies across the state's entire roadway network, in all jurisdictions. Implementing high quality policies on a smaller, regional scale helps set benchmarks that can later cover an entire state.

#### PROCESS

The study team obtained municipal codes online in October 2014. The team has also received regular updates from the client and local advocates concerning recent changes to legislation within the study area. Although they impact local-level policy decisions, state-level ordinances are excluded from this review. For this reason, the review does not discuss recent changes to statewide driver's education through the Nathan Bower Act (HB 5438). The project's original technical memorandum regarding the Bicycle Ordinance Review provided the full text of the Nathan Bower Act, for the Steering Committee members' knowledge.<sup>1</sup>

The team reviewed relevant ordinances based on the criteria described in the callout box below. The team recommended revising or deleting existing policies that fall short in one or more of the above areas. The team also made recommendations for spreading existing beneficial legislation throughout the study area.

### Criteria:

The team asked the following questions to rate each ordinance:

- Is the existing policy likely to produce increased risk or harm to bicyclists?
- Does the existing policy hamper efforts to promote bicycles?
- Does the policy increase one's effort to obtain or operate a bicycle without justified cause?
- Does the policy follow current engineering, planning, and design terminology?
- Does the policy endanger future innovation and policy language evolution?
- Is the policy especially arduous or time consuming for the agency to enforce?

<sup>1</sup>HB 5438 amends Michigan driver education curriculum to include content related to bicycles and motorcycles. The Act states, "Classroom instruction shall include information concerning the laws pertaining to bicycles and motorcycles and shall emphasize awareness of their operation on the streets, roads, and highways of this state."

## **Emerging Issues:**

The project team and the Steering Committee also reviewed a number of emerging issues. These topics that are not discussed within study area municipal codes, but are likely to become more pertinent topics with increasing levels of bicycle friendliness.



The 2014 City of Grand Rapids ordinance against motor vehicle parking in bicycle lanes, although met with initial public skepticism from people who do not use bicycles for transportation, will help improve the condition of local bicycle facilities. This handout was created by the Spoke Folks and the City of Grand Rapids (Image credit: MLive.com).

		8)	
Торіс	Existing Policy	Recommended Change(s)	Considerations for Policy Revision and Justification Thereof
E-assist or electric bicycles	The City of Grand Rapids states that only non-electric bicycles be used on off-street trails. There is no mention of e-assist or e-bikes on other facilities.	Policies should specifically allow e-assist bicycles on all public and private road- ways, including all classes of bikeways. The policy definition of "bicycle" should could also include e-assist bicycles . E-bike definitions should include a maximum speed.	E-assist and electric bicycles are increasing in popularity across the country. Policies should anticipate the potential for higher e-assist ridership rates.
Regulations about number of bicyclists riding abreast	Existing policy language specifies that bicyclists must ride single file. The majority of study municipalities do not have any formal policies on record.	Policies should recognize riders' right to travel two abreast, while also recog- nizing that there may be times they travel in a single file procession.	Riding two abreast allows riders to travel in a more compact line. This offers safety benefits as passing motorists do not have to spend as much time in the opposite travel lane. The policy language should not discourage riding single file, as there are circumstances when this is safer, such as on roadways with wider vehicular travel lanes where there is more space for passing cars.
Parking in bicycle lane prohibited	To-date, only one jurisdiction has passed legislation prohibiting motor vehicle parking in a bicycle lane.	Policies should prohibit motor vehicles from parking in a bicycle lane. The policy should reinforce the new law by citing specific fines for such behavior.	Prohibiting motor vehicle parking in a bicycle lane throughout Kent County and beyond will remove potential obsta- cles from cyclists' paths and reinforce the idea that bicyclists are entitled to the roadway.
Mandatory passing guidelines for motor vehicles overtaking bicyclists	No policies currently exist within the study area.	Study area municipalities should adopt policy mandating that motorists give bicyclists at least three feet of passing distance, measured from the end of the motorist's mirror. The policy would also mandate additional passing space by drivers of commercial vehicles, such as trucks.	To-date, 25 states have safe passing laws on record that require at least three feet of passing distance. Some communities have instituted their own requirements in the absence of state- level legislation. Other variances include a four foot passing distance requirement in Pennsylvania and other communities' mandates for commercial vehicles' addi- tional passing clearance (e.g. six feet).
Bicycle registration	Of the communities reviewed for this study, a majority of municipal codes feature mandatory bicycle registration.	The team recommends that each community repeal their registration ordinance.	Mandatory bicycle registration is cumbersome and time consuming to enforce. Communities outside the study area have experienced police harassment, rider deterrence, lack of enforcement, and high administrative costs needed to cover the program.
Bicycle dealer reports to police	Buyers and sellers of secondhand bicycles must report such activities to the police.	This report recommends repealing the ordinance enforcing mandatory second- hand bicycle reports.	Reporting the buying and selling of secondhand bicycles requires time and effort to maintain without measur- able benefits. Such activities may discourage a burgeoning bicycle culture by placing an obstacle to obtaining a bicycle. Additionally, undocumented persons may be fearful of reporting their personal information to the police.
Bicycle speed regulation	One community's code language sets a trail speed limit of 10 mph. Another leaves the allowing operating speed up to the individual rider so long as they do not "operate a bicycle at a speed than is reasonable and prudent under the conditions then existing."	Discontinue set speed limits for bicycles. The municipalities can set a more real- istic expectation by adopting language similar to that already used by City of East Grand Rapids: "No person shall operate a bicycle at a speed greater than is reasonable and prudent under the conditions then existing."	Such ordinances are not realistically enforceable. Additionally, most cyclists do not have mounted GPS units, making speed monitoring difficult.

Table 14. Bicycle-specific ordinances with suggested actions<sup>2</sup> according to study area jurisdiction

<sup>2</sup> No bicycle-related policies were found for Alpine Township, Grand Rapids Township, and Plainfield Township. The table does not show these jurisdictions. Roadway users are held responsible to state-level legislation in the absence of local area jurisdiction.

Priority	City of East Grand Rapids	City of Grand Rapids	City of Grandville	City of Kentwood	City of Walker	City of Wyoming
Low	Add policy	Revise (Title X - §10.132)	Add policy	Add policy	Add policy	Add policy
Mid	Revise (Title X - §10.33)	Add policy	Add policy	Add policy	Add policy	Add policy
High	Add policy	No change. Legislation passed in 2014.	Add policy	Add policy	Add policy	Add policy
High	Add policy	Add policy	Add policy	Add policy	Add policy	Add policy
High	Delete (Title X- §10.42)	Delete (Title X- §10.141)	Delete (Ch. 25. Article IV. Division 2)	No change	No change	Delete (Article IV. Division 2. §78-131)
Mid	No change (Title X- §10.34)	Revise (Title	No change – consider adopting language similar to East Grand Rapids	No change - consider adopting language similar to East Grand Rapids	No change - consider adopting language similar to East Grand Rapids	No change - consider adopting language similar to East Grand Rapids

Topic	Existing Policy	Recommended Change(s)	Considerations for Policy Revision and Justification Thereof
Sidewalk riding prohibition	Current policies prohibit sidewalk riding in central business districts and where marked with signage.	Sidewalk prohibitions should be kept to business districts. Families using the sidewalk in residential areas away from these areas, for instance, could arguably utilize sidewalks in a safe and respectful manner.	Education about the dangers of side- walk riding, rather than enforcement is usually more effective. High rates of sidewalk riding suggest infrastructure conditions that are unwelcoming or deemed hazardous to riders.
Stop required when entering roadway or crosswalk, or when crossing an intersection	One jurisdiction's code of ordinances enforces this requirement.	Policy language should enforce yielding to bicyclists in all situations. Existing language from Grand Rapids can be spread throughout neighboring jurisdictions.	Enforcing motorists' responsibility to yield to bicyclists in all situations, including entering a roadway or trav- eling through an intersection helps protect non-motorized users from collisions. Policy language should also enforce motorists' responsibility to yield to bicyclists when the motorist is turning (discussed later in this table).
Vacation of street, alley, public ground	One community's codes discuss right- of-way (ROW) vacation. The City shall notify the public and other interested parties who may have interest in the land.	Consider adopting language that priori- tizes using vacated land as bicycle and/or pedestrian space. The City of Grandville should add this language to its Code. Other cities should adopt such policy.	Right-of-Way vacation offers a unique opportunity to convert land to bicycle and pedestrian space. Alley or railroad vacation are two examples.
Mandatory use of bicycle facilities	Existing policy language mandates bicycle travel on paths, where provided, instead of traveling on the roadway.	The team suggests removing policy language that prohibits traveling on the roadway in cases where an off-street path exists. The team does not recom- mend instituting mandatory use laws.	Facilities with excessive debris or damage may necessitate riders using the roadway instead of adjacent sidepaths. Such behavior should not be penalized. Ideal language would explicitly state that bikes can legally choose to use either the sidepath or the roadway, thus protecting cyclists from mandatory use of facilities that do not meet their needs. Installing new bicycle infrastructure in communities with mandatory use laws often creates opposition from existing cyclists. This results in additional barriers to encouraging new bicyclists. Additionally, some communities across the country have installed bike lanes and sidepaths along one corridor. Existing policy would not allow bicyclists to use these facilities should they be built in the study area.
Mandatory obedi- ence to traffic control devices	One study area community's code includes a mandate that bicyclists obey traffic signals, signs, and other devices.	All study area jurisdictions should consider adopting policy to mandate bicyclists' obedience to traffic signals, signs, and other devices.	The ordinance reminds bicyclists of their responsibilities as vehicles on the roadway and enforces signal compliance.

Priority	City of East Grand Rapids	City of Grand Rapids	City of Grandville	City of Kentwood	City of Walker	City of Wyoming
Low (no policy change	No change (Title X- §10.31)	No change (Title X- §10-132)	No change	No change	No change	No change
High	Add policy	No change (Title X- §10.18)	Add policy	Add policy	Add policy	Add policy
Low	Add policy	Add policy	Revise (Chapter 23. Article I- §23.1)	Add policy	Add policy	Add policy
Mid	Add policy	Add policy	Add policy	Delete (Chapter 66. Article 5 §66-134)	Add policy	Add policy
High	Add policy	Add policy	Add policy	Add policy	Add policy	No change (Chapter 78. Article IV- §78-103)

Торіс	Existing Policy	Recommended Change(s)	Considerations for Policy Revision and Justification Thereof
Mandatory helmet usage for those under 18 years of age	One community mandates helmets for bicyclists under 18 years old.	The team recommends leaving the policy as-is. The team does not recommend an expansion of mandatory helmet laws throughout the other communities. If additional communities are interested in adopting helmet laws, they should apply to youth only. The City of East Grand Rapids should ensure that law enforce- ment officers do not use mandatory helmet laws as a scapegoat for dispro- portionate policing in communities of color and/or neighborhoods with lower socio-economic status.	Mandatory helmet laws often have the opposite effect of increasing safety. The policies discourage bicycle use. Helmets provide limited protection compared to other tactics, such as building protected facilities to separate vulnerable users from motorized traffic. Poorly fitted helmets offer even less protection. Education is recommended instead of enforcement. Helmet lawsThey require many resources for their enforcement, which agencies could use elsewhere. Although Hhelmet laws for minors can could remind parents about their role in encouraging their children's safe bicycling, safety role helmets play in children's ridingthe legislation can pavecreate additional points of conflict the way for disproportionate policing of children of color between law enforce- ment and minority communities (see column to the left for more information)
Disposal of aban- doned bicycles	Impounded or unclaimed bicycles in one community are sold at public auction.	The communities should consider donating bicycle public auction funds to the respective community's bicycle infrastructure and non-infrastructure projects. Another option is to donate bikes to local organizations that rehab the bicycles and provide them to community members, schools, or other philanthropic organizations.	The current system of auctioning bicycles at public auction gives residents a chance to buy bicycles at a lower price than buying them new. This increases the public's access to bicycles. Donating the proceeds to the agency's bicycle program or public works budget could add a small amount of money back to bicycle-related projects.
Bicycles are allowed within bus only lanes	Several Kent County communities are adding bus rapid transit (BRT) lines within their cities. Grand Rapids prohibits bicycle travel in these lanes during peak hours. Wyoming, which has also added BRT, allows bicycles to use high occupancy vehicle lanes (HOVs), which are used by BRT vehicles.	The study team recommends allowing bicycles within HOV lanes throughout all hours of the day. Communities should revisit whether daily transit vehicle volumes are such that bicyclists are endangered by riding in these spaces during morning and evening peak travel times. Communities can revisit the legislation should they increase bus service to a frequency and/or speed that would endanger bicycles within the space. In this case, communities should also consider infrastructure—such as bollards, concrete barriers, or other devices—which demarcate the bus-only space.	Current buses traveling along BRT lines leave the station every 10 minutes within peak hour periods.
Opening vehicle doors	The existing ordinance states that no person shall open a car door facing the roadway because of interference with other vehicles using the roadway.	Although bicycles are legally classified as vehicles, and are thus included in this ordinance, language could be amended to more specifically discuss the threat to bicyclists. Jurisdictions should review existing fine structures and consider increasing fines for "dooring" type crashes and other behavior that endan- gers bicyclists.	Opening car doors in the paths of bicy- cles forces bicyclists to unexpectedly dodge the sudden obstacle and merge into the path of faster moving traffic. Dooring crashes can severely injury or kill cyclists as they are thrown from their bicycles and into traffic. In 2008, the City of Chicago reviewed municipal fine structures and language related to bicycle ordinances. Petty offenses result in \$150 fines. Offenses resulting in a bicycle-car crash result in \$500 fines. *

Priority	City of East Grand Rapids	City of Grand Rapids	City of Grandville	City of Kentwood	City of Walker	City of Wyoming
Low (no policy change recom- mended)	Title X. Chapter 105 - No change	No change	No change	No change	No change	No change
Low	No change	No change	No change	No change	No change	Revise (Chapter 78. Article IV §78-103)
Mid	Add policy	Revise. Existing policy says bikes prohibited during peak hours.	Add policy	Add policy	Add policy	No change (Chapter 78. Article IV §78-180)
High	Add policy	Revise. (Title IV. Article 6§10.111)	Add policy	Add policy	Add policy	Add policy