National Park Service
U. S. Department of the Interior
Pacific West Region

NPS Safety Analysis Report: Commercially Guided Bicycle Tours Haleakalä National Park February 27, 2008

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Introduction and Purpose

On December 10-14, 2007, a National Park Service (NPS) review team began a safety analysis of commercial bicycle tours at Haleakalä National Park. Pacific West Regional Director Jonathan B. Jarvis appointed the team in response to a "safety stand down" of the activity initiated by Haleakalä National Park Superintendent Marilyn Parris. The Superintendent initiated the stand down on October 10, 2007, following a fatal bicycle accident involving a commercial bicycle tour participant that occurred on September 26, 2007, and in response to a long history of serious accidents among bicycle tour clients.

The review team was charged with the following:

I. Conduct a risk assessment of commercial bicycle tour operations in Haleakalä National Park to determine if restrictions beyond the emergency safety stand down are necessary for the maintenance of public health and safety and to protect park visitors;

II. Identify other circumstances that should be considered in determining if this activity can be conducted in a manner that maintains public health and safety and is protective of park visitors;

III. Assess permit requirements for these operations, and determine if these companies have been compliant with safety requirements;

IV. Given the design/alignment of park road, assess if road can safely accommodate commercial bicycle tours along with all other public and administrative uses and is such use sustainable for the park;

V. Present assessment team findings and recommendations to a Board of Review, for appropriate action.

Background

Commercially guided bicycle tours have been occurring within Haleakalä National Park since 1986. These tours, approximately 30 miles in length, begin at the crater parking area at approximately 10,000 feet in elevation and descend 11 miles and 3,500 feet of elevation through the park. The tours then continue outside the park boundary for approximately 20 more miles and finish in various locations at or near the ocean. The road inside the park is two lanes, has no shoulder, experiences sections of 5-6% grades, and has paved pullouts approximately every 1-2 miles. The terrain adjacent to the roadway is steep, rocky, and unforgiving of those riders unfortunate enough to leave the roadway.

When the park superintendent (at the time) initially authorized this commercial activity for the first time in 1986, the total client numbers were 24,000. Numbers have increased steadily with the highest recorded client total reaching 106,000 in 2005. In November, 2005, the park implemented an Interim Operating Plan to manage commercial services while they were developing a Commercial Services Plan. Under that Interim Operating Plan, total bicycle tour client numbers are capped at 90,000 per year.

In 2006, bicycle tour clients represented 6% of the park's total 1,471,238 recreational visits. According to a 2004 Visitor Study, just over two thirds of all visitors to the Haleakala Visitor Center visit during the sunrise period. That same study indicated that the peak visitation period for the park is between the hours of 4am and 10am.

Commercial bicycle tours within Haleakalä National Park have had a history of serious accidents and injuries. Although the injury rate has decreased, the number of commercial bike tour participants has increased. As a result, the total number of injuries has remained steady at approximately 60 injuries per year since 2003. The highest number of injuries to occur in a single year was 126 (25 of which were serious) in 2000.

After a client fatality in 1998, the NPS conducted a root cause analysis and established a bicycle work group to develop and implement a Safety Action Improvement Plan. The root cause analysis determined that weather (leader should have aborted the ride), equipment (brake failure, helmet fit), and speed were the primary causes of accidents. As a result, the NPS added to the permits an addendum of specific park conditions. The addendum added new and strengthened existing operational and safety requirements including bike safety inspections, maximum group size limits, launch intervals, additional personal protective equipment (PPE), bicycle leader and a vehicle escorts, accident reporting, and at least one first Aid -First Responder level qualified employee per tour group.

Starting in 2001, client injury rates declined considerably and have remained relatively steady over the last several years. This decline is likely because of the above changes and increased oversight of the program; however, the seriousness of the injuries, including the two recent fatalities in 2007, has prompted the NPS to reassess the safety and future viability of commercial bicycle tours at Haleakalä National Park.

Current Status

On September 26, 2007, a bicyclist on a commercial bicycle tour lost control of her bicycle on the downhill run from the crater parking area and was struck and killed by a vehicle operated by another commercial bicycle tour. This was the second fatality of a commercial bicycle tour client in the park within a 12-month period. Three other serious injuries occurred within this same 12-month period, one a near fatality.

In order to maintain public health and safety, the park superintendent ordered an emergency safety stand down of all commercial downhill bicycle tours (pursuant to 36 CFR 1.5), so that the NPS could evaluate the safety of continuing this activity and decide whether to issue permits for commercial bicycle tours at any point in the future. In addition to the safety stand down, the superintendent suspended all permits for commercial bicycle tours within the park, effective October 10, 2007. These CUAs were due to expire on December 31, 2007, with no right to future renewal.

During the first thirty days of the emergency safety stand down, the NPS provided the bicycle tour companies an opportunity to submit information for the NPS to consider in developing alternatives to mitigate bicycle tour related public safety risks. The team addressed and incorporated that information into this report.

Commercial bicycle tours are among several commercial services available within the park. In August 2006, the park initiated a planning process for commercial services within the park. The purpose of this planning process is to identify the commercial service needs and those current operations within the park that meet NPS policies and are consistent with park purposes. This plan will include a framework for managing commercial services to maintain high quality visitor experiences and to preserve and protect the natural and cultural resources of the park. If the immediate safety concerns with commercial bicycle tours can be resolved, the long-term management of this activity will be determined by the commercial services planning process.

As of October 2007, seven authorized commercial bicycle tour companies provided bicycle tours within the park—the five companies that guide bicycle tours from the crater are the focus of this report. These five companies provide forty guided tours per day, with a maximum of fourteen riders per tour including the tour guide. Under the Interim Operating Plan, 90,000 visitors participate in commercial bicycle tours per year. Tours typically arrive in the park before sunrise and continue throughout daylight hours. Bicycle tour companies advertise widely throughout the islands and in travel- and adventure-related venues worldwide. The park charges an application fee of approximately $250 per permit and receives approximately $40,000 annually from CUA administrative fees and cost recovery revenue for monitoring.

The current safety stand down will remain in effect until after a Board of Review meets in early February to make final recommendations to Regional Director Jonathan B. Jarvis and Superintendent Marilyn Parris, who will make the final decision on the short-term future of commercial bicycle tours within the park. If the park allows commercial bicycle tours to continue, the comprehensive commercial services planning will determine the long-term future of this activity, including issues beyond the scope of this safety review.

Safety Analysis Process

The safety review team assessed the commercial bicycle tour program based on an Operational Risk Management (ORM) process. The military and other governmental and private sector entities use ORM to plan and safely execute operational missions and activities.

The NPS uses ORM to plan and execute a variety of missions and programs. Although the NPS does not conduct commercial bicycle tours directly, through a CUA or another permitting instrument, the NPS has the authority to place management controls on how tour companies conduct commercial activities. The ORM process will suggest standards and procedures that could be required of tour operators in order to make this activity safer. The team also evaluated park management activities related to facilities maintenance, ranger operations, and other visitor management activities that have a direct bearing on the safety of commercial bicycle tours within the park.

Operational Risk Management

Operational Risk Management is a structured approach to planning missions and activities that provides a consistent framework for assessing, mitigating, and ultimately accepting risk when the benefits of an activity clearly outweigh the risks to participants.

Four Core Principles

There are four core principles of ORM as follows:

1. Accept no unnecessary risk
2. Accept risk when benefits outweigh the cost
3. Make risk decisions at the appropriate level
4. Anticipate and manage risk through planning

Seven Key Steps of ORM

There are seven key steps of ORM; this assessment will address steps 1-4 and will introduce and lay the foundation for Step 5. Step 5 will be the primary subject of the February 2008, Board of Review. Ultimately, the park will implement Steps 6 and 7 based on the recommendations of the Board of Review and the final decisions by the Regional Director and Superintendent.

ORM Steps

1. Define Mission
2. Identify Hazards
3. Assess Risk
4. Identify Options
5. Evaluate Risk vs. Gain
6. Execute Decisions
7. Supervise (watch for changes).

Initial Research and Analysis

In addition to the ORM steps outlined above, the review team's first objective was to lay the foundation for analysis as follows:

1. Understand the commercial bicycle tour activity.
2. Understand the current and historical accident rates and severity.

Understanding the commercial bicycle tour activity

The park provided the review team with substantial information about how bicycle tour companies operate within the park. This information included the terms and conditions specified by the NPS as part of the CUA process and operating information and safety plans provided by the commercial bicycle tour companies. The team interviewed bicycle company owners and tour participants to understand how the tour companies typically conduct these trips. The team also interviewed park personnel in order to understand how the park manages the operational and administrative aspects of the commercial downhill bicycle tours and how those activities interact with other park operations and visitor management activities. Additionally, to approximate the riding experience of a typical tour client, the team bicycled as a group with a vehicle escort from the Haleakalä Crater to the headquarters visitor center (approximately 10 miles).

Findings:

Commercial bicycle tour companies follow three basic operating models for the tours. Model 1) The tour company buses their clients into the park and starting from the Haleakalä Crater, guides them down the road through the park with a guide on a bicycle at the front of the group and the tour van at the rear. Model 2) The tour company buses their clients into the park to watch the sunrise, then buses them out of the park and the clients travel unguided and unaccompanied outside of the park towards the ocean, meeting the tour van at various pre-designated locations along the route. Model 3) The tour company buses their clients into the park to watch the sunrise, then buses them out of the park

and conducts a guided ride from outside the park boundary towards the ocean. Because Models #2 and #3 do not involve clients riding bicycles within the park (and therefore, do not produce bicycle accidents within the park), this analysis focused only on the first operating model and those five companies who use it.

In the case of model #1, most of the tour companies pick their clients up at their respective hotels and provide them with equipment and orientation at the Haleakalä Crater in the park. One company meets their clients at their bicycle shop the morning of the ride and outfits them with equipment and orientation material and then travels to the park. In either case, in model #1, the tour companies conduct a safety briefing and a check ride around the parking lot prior to departing on the tour.

CUA conditions for bicycle tours include limits of 13 clients per group, a requirement for one leader on a bicycle and an escort vehicle for each group, and a requirement to allow following traffic to pass, either at a legal passing zone or by pulling off the roadway.

There are approximately 40 bicycle tours per day in the park. Nineteen of the tours start from the summit crater shortly after viewing the sunrise over the crater and the remainder start from the summit crater at later hours throughout the day. After the check rides around the parking lot and safety briefing, the tour groups head down the hill with a guide in the front of the group on a bicycle, the clients spaced thirty feet apart with the slowest identified rider typically placed in the first position behind the guide, and the tour van following the last rider in the group.

CUA conditions require groups to stagger their departure from the summit to allow at least a ten-minute interval between each group. This requirement creates breaks between tour groups to allow vehicle traffic to move less impeded through the park.

During the ride, the leader sets the pace and instructs all riders to stay together and maintain their spacing between bicycles. Riders are required to walk their bikes around one particularly tight curve near the Kalahaku Overlook turnoff. Because there are few vehicle passing zones, bicycle tour groups are required to allow vehicle traffic to pass by pulling off the road when pullouts are available. Because drivers do not know when or where bicycles will pull off the road, if ever, they tend to become impatient and pass in illegal passing zones.

All bicycle tour companies provide riders the option of riding in the tour van on the way down because of fatigue, fear, or recognition that they do not possess the requisite skills and abilities required to descend safely on a bicycle. Because there are few opportunities to communicate with tour guides during the descent, some bicycle tour participants with whom we spoke stated that despite being uncomfortable, once they started downhill, they felt that they had no way of opting out of the ride at that point.

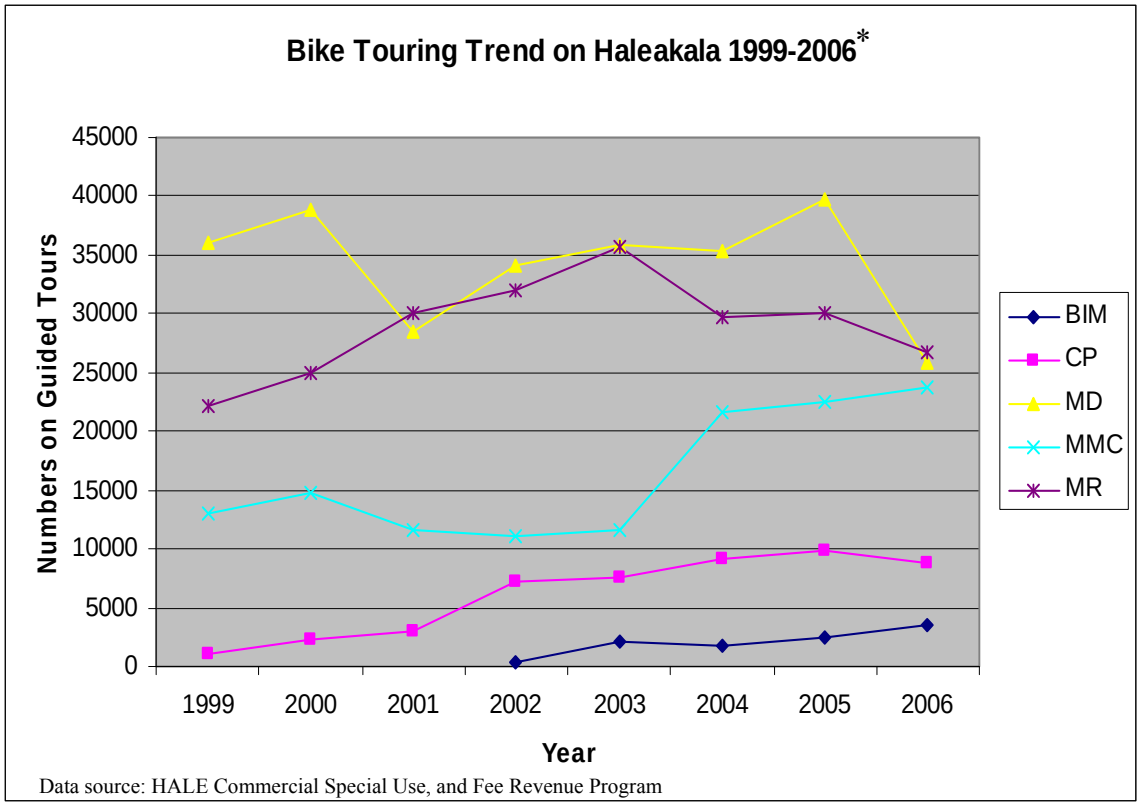
Although there is no requirement that NPS personnel be on duty for the bicycle tours to operate, the NPS routinely provides ranger staffing during the sunrise visitation period to oversee the commercial tour operations, ensure compliance with permit conditions, mitigate conflicts (particularly at the crater parking area), and be available to respond to accidents and injuries. Including the bicycle tours, approximately two thirds of the daily visitors to the summit area arrive during the early hours of the morning to view the sunrise from the crater rim.

Understanding the current and historical accident rates and severity

The review team analyzed data provided by the park including total client numbers and accident numbers from 1999 through 2006, and only for that portion of the bicycle tours that occurs inside the boundary of the park. The team cross-referenced that information with local hospitals and ambulance services in order to develop a level of confidence in the accuracy and completeness of the information.

Client Numbers

The team compared the five bicycle tour companies that provide tours in the park. The following graph shows the number of bicycle tour clients for each company from 1999 through 2006:



Data source: HALE Commercial Special Use, and Fee Revenue Program

*__BIM__ = Bike It Maui, __CP__ = Cruiser Phil's
__MD__ = Maui Downhill, __MMC__ = Maui Mountain Cruisers
__MR__ = Maui Riders

Haleakalä National Park Injury Data

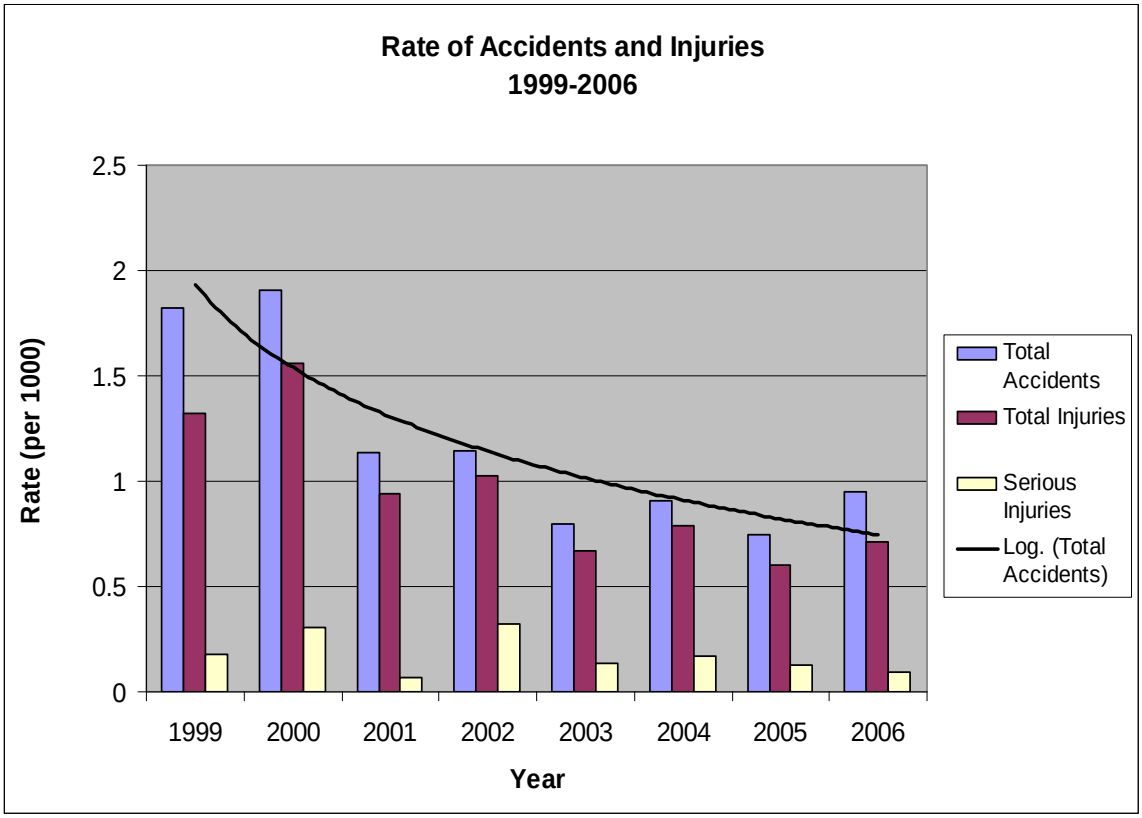
CUA conditions require bicycle tour companies to report all accidents that occur inside the park by completing the Bicycle Accident Report Form supplied by the NPS. The park enters those reports into their Case Incident Reporting System. The review team obtained the accident, injury, and violation data reviewed in this report from the park's Case Incident Record system. The data for 2007 is incomplete because of the safety

stand down and early termination of the bicycle tour CUAs in October of that year. The team, therefore, did not include the 2007 accident/injury data in the report.

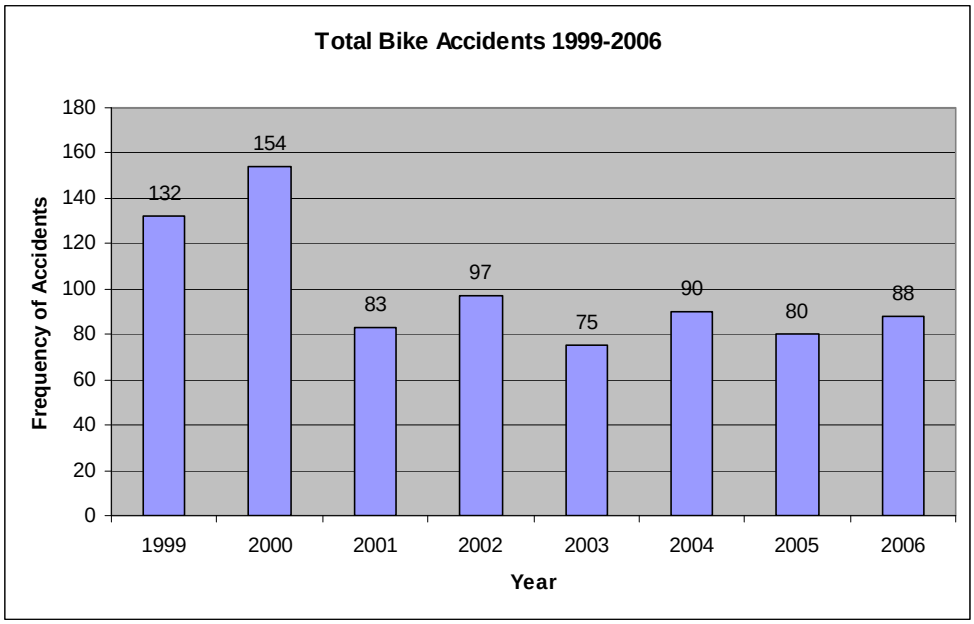
According to park data, the injury rate for the 1999-2006 was 8.5 injuries per 10,000 riders (597 injuries for 703,912 riders). During this period, the annual injury rates have declined, particularly after the 1999 review. Changes implemented by the NPS and the bicycle tour companies after the 1999 review probably caused much of this decline. It is unlikely that non-compliance with reporting requirements is responsible. After the 1999 review, the park required companies, through special conditions in the CUA, to report all accidents. Accident investigation was a high priority for the park and during interviews, several people indicated that they thought reporting was far better than it had been previously. This is supported by the consistency between the NPS injury records and those of the local ambulance and hospital records.

Some accidents do not produce injuries, but because all accidents represent an undesirable event that could produce an injury, the team has included all accidents in most of our analyses. For comparison, the following graph shows the relative relationship among accident rates, overall injury rates, and serious injury rates. A serious injury requires medical follow-up/treatment including fractures, head or spinal injuries, or deep lacerations.

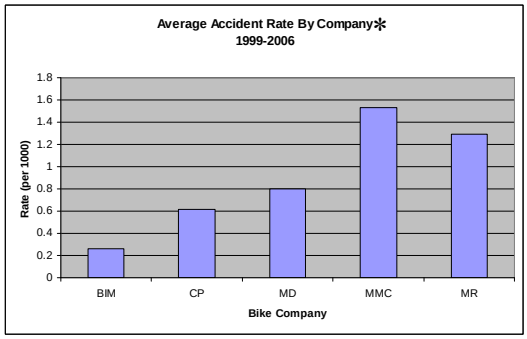
The following graphs show accident and injury rates per 1000 bicycle tour clients.

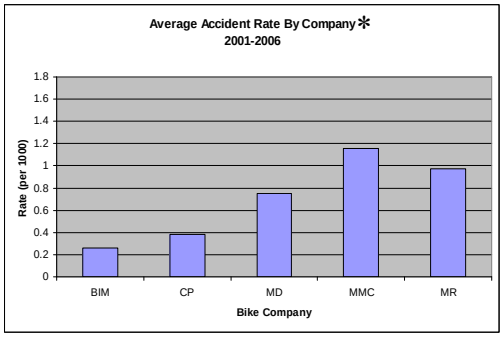


Although the accident rates have declined, a steady increase in the number of clients has kept the accident and injury numbers relatively stable.



The accident rates vary considerably by company, which may indicate that the business practices of different companies are a factor in determining accident risk. Bike It Maui and Cruiser Phil's have very low accident rates which may indicate that a particular company-specific operating practice can produce low accident rates.



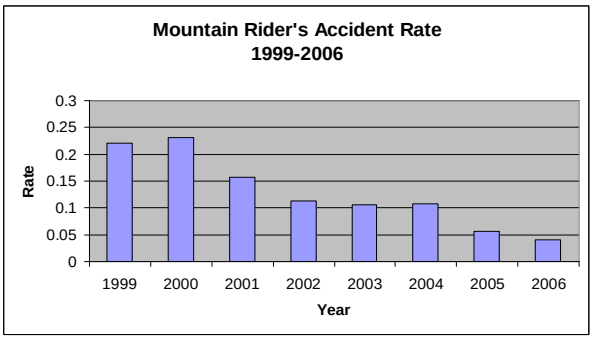


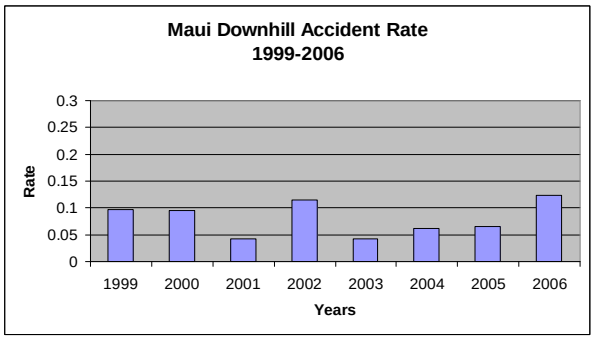
Several companies' accident rates declined significantly[1] following the changes made subsequent to the 1999 root cause analysis and work group follow-up actions (e.g. additional management controls required in the permits). The team identified no other explanation for this decrease; it is likely that the increased structure and oversight imposed on the bicycle tour companies had a positive effect on the injury rates. After the 1999 review, the workgroup provided some useful information and tools to assist the tour companies in accomplishing this goal. This finding indicates that the NPS and the bicycle tour companies can influence the safety of this activity.

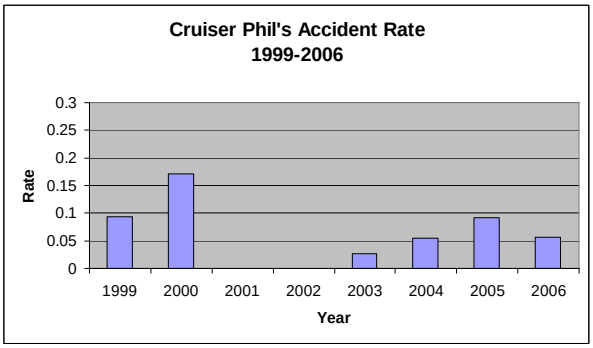
[1]There was a statistically significant difference (χ^2 P<.01) between the proportion of accidents in 2000 and the proportion of accidents in 2001

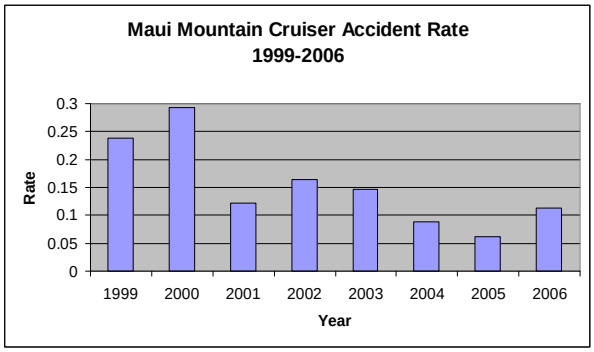
*__BIM__ = Bike It Maui, __CP__ = Cruiser Phil's
__MD__ = Maui Downhill, __MMC__ = Maui Mountain Cruisers
__MR__ = Maui Riders

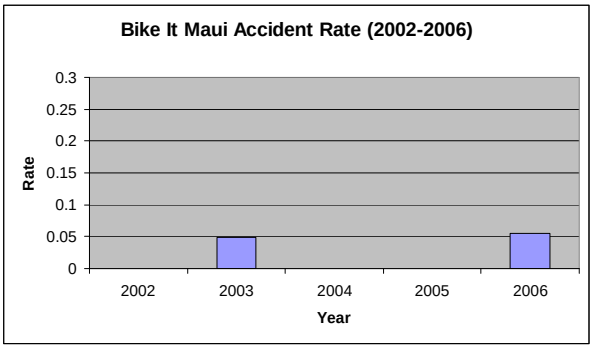
The individual accident rates for companies conducting bicycle tours within the park are shown below.







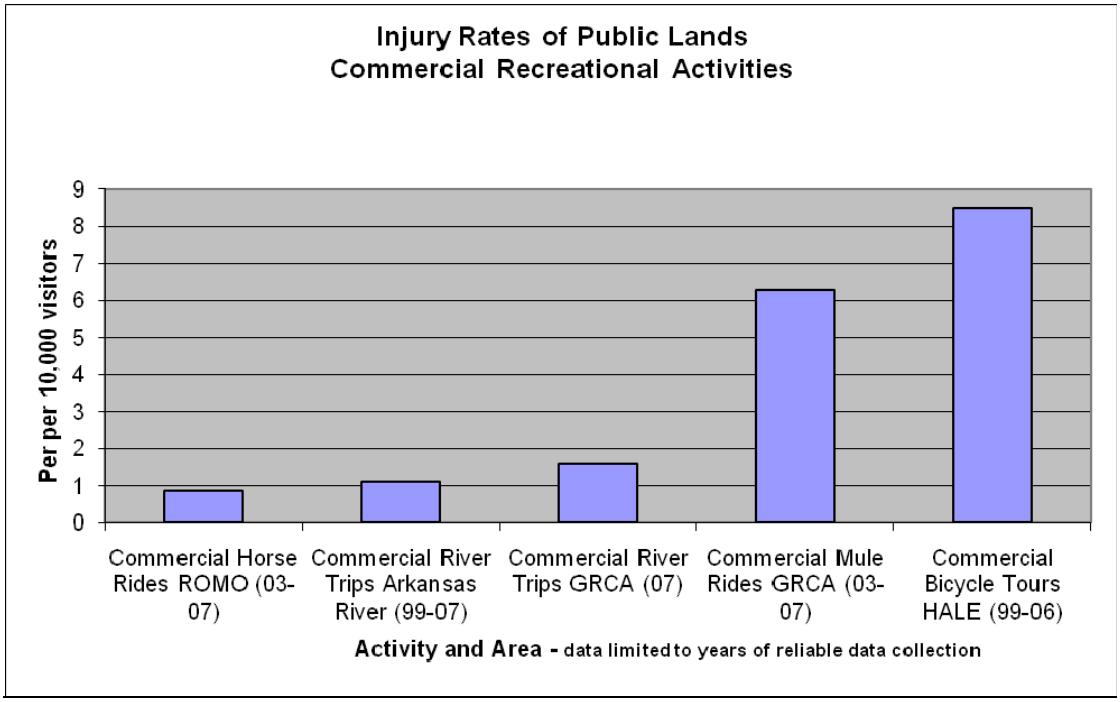




Commercial Recreational Activities on Public Lands Injury Data

To assess the severity of bike accidents on Haleakalä the team compared how bicycle injury rates in Haleakalä compared to injury rates among other similar recreational activities throughout the country. The team reviewed a variety of commercial use recreational activities at two National Parks and on the Arkansas River in Colorado. The National Parks included Rocky Mountain National Park and Grand Canyon National. The team examined bicycling, mule riding, horseback riding, and whitewater rafting. Overall, the injury rates for all of these activities were lower than the rates of injury for commercial bicycle tours in Haleakalä, although the fatality rates for whitewater rafting on the Arkansas River in Colorado were higher.

The following graph shows the injury rates for commercial bicycle tours in relation to other commercial activities:



Because the record keeping and the combination of risk factors varies from activity to activity, it is difficult to make decisive comparisons among these diverse activities and locations. However, under any circumstances, the NPS has a desire to reduce the injury and fatality rates for commercial bicycle tours at Haleakalä National Park.

I. Conduct a risk assessment of commercially guided downhill bicycle tour operations in Haleakalä National Park to determine if restrictions beyond the emergency safety stand down are necessary for the maintenance of public health and safety and to protect park visitors.

Applying the ORM process to bicycle tours

Once the team understood current operations and the managerial context of commercial bicycle tours, we applied the ORM process to assess the safety of this activity.

ORM Steps
1. Define mission
2. ID Hazards
3. Assess risks
4. ID Options
5. Risk vs. Gain

1. Define Mission

The team defined "mission" for the purposes of this review to be, "Conduct a commercial guided bicycle tour from the crater to the park boundary without injury to clients, guides, other visitors, or NPS employees."

2. Identify Hazards

ORM Steps
1. Define mission
2. ID Hazards
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The review team took a three-pronged approach to hazard identification that included identifying threats to the safety of bicyclists and others, identifying errors made by bicyclists or others that lead to injuries, and identifying factors that lead to those errors.

A. Identify threats to the safety of bike tour clients and others

By analyzing accident reports, interviewing tour company employees, interviewing accident victims, and bicycling the tour route through the park, the review team identified the following major threats to the safety of participants and others:

- Running into another cyclist
- Being run into by another cyclist
- Crashing the bike on the roadway
- Crashing the bike off the roadway
- Collision with an up bound vehicle
- Collision with a down bound vehicle
- Collision with a fixed object (curb, rock, sign)
- Collision with a pedestrian
- Causing a collision between motor vehicles

B. Identify errors made by cyclists that lead to injury

By analyzing accident reports, interviewing bicycle tour company employees, accident victims, park personnel and emergency medical personnel, and

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bicycling the tour route, the review team identified the following errors that appear to relate to the above threats:

- Traveling too fast into a curve
- Applying too much front brake
- Not reacting quickly enough to a bicyclist braking in front of them
- Failure to see/avoid debris in the roadway
- Loss of balance
- Loss of control
- Operating across the centerline of the road
- Riding off roadway
- Traveling too close to the bicycle in front of them
- Traveling too close to the road edge

C. Identify Factors and conditions that contribute to above errors

The review team then identified the following factors that appear to contribute to or cause the above errors. They are broken down into three categories: Human (the rider or other people), material (equipment related), and environmental (weather, road conditions, visibility, road debris):

Human	Material	Environmental
Fatigue (lack of sleep, altitude, hangover, short of breath, dizzyness)	Excessive front braking causes loss of control	Road character
Panic (excessive speed, cars passing, approaching sharp curve, exposure)	Bike requires significant skilled rider input to control	Road condition
Lack of skill operating bike	Improper bicycle fit	Weather (rain, fog, wind, gusts, ice)
Lack of hazard awareness	Helmet limits visibility of rider	Narrow road
Unfamiliar with equipment	Helmet limits hearing of rider	No shoulder
Inadequate orientation	Improper clothing (open toe shoes, shorts, etc.)	Unmarked curbs
Peer pressure to keep up	Bicycle equipment failure (flat tire, brake failure, etc)	Other vehicles on road (buses, cars, vans)
Inattention (watching view, complacency)		Altitude
Speed control		
Blood sugar		
Overall health and fitness		
Drugs or alcohol (including prescriptions)		
Divided attention		
Personal comfort (hot/cold)		
Riding too close to road edge		

ORM Steps
1. Define mission
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5. Risk vs. Gain

3. Assess Risk

The review team used the Green-Amber-Red (GAR) model (a standard risk assessment tool used to assess general risk) as part of the ORM process. This tool provides a structured way to evaluate eight elements that significantly influence risk in operations. In other words, if an activity produces an accident or injury, it will generally be because of weaknesses in one or more of these areas. Conversely, if a team improves these elements, the probability of an injury will likely decrease. Recognizing that one can never eliminate all risk, ultimately decision makers must decide what residual level of risk they will accept in order to continue a given activity.

For this review, in accomplishing the mission defined above, we included tour company personnel and the clients as part of the "team" that working together will accomplish that mission.

The eight risk elements are as follows:

Supervision

Supervisory control should consider both how qualified the supervisor is and whether supervision is actually taking place. Even if a team member is qualified to perform a task, supervision acts as a control to minimize risk further. This may simply be someone checking what others are doing to ensure it is correct. The higher the risk or the more complex the task or environment, the more the supervisor needs to observe and check. A supervisor who is actively involved in performing a task rather than observing employee performance and checking for compliance with procedures can be distracted easily and is not an effective safety observer in moderate to high-risk situations.

Planning

Planning status depends upon how much information one has, how clear it is, and how much time one has to plan the incident or evaluate the situation. Planning includes the development and use of pre-defined plans, training programs, and operating procedures.

Contingency Resources

Contingency resources are those pre-defined resources that a team will call in an emergency or when incident or activity demands exceed the capability of existing resources. Items to consider include what resources are available, how to activate them, how long will it take them to respond, etc.

ORM Steps
1. Define mission
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Communication

Good communications ensure clear and accurate sending and acknowledging of information, instructions, commands, and useful feedback. This includes interpersonal communications and the physical communication equipment if personnel are not within immediate voice contact.

Team Selection

Team selection considers the qualifications and experience level of the individuals involved in an incident or activity. The participants in a mission or activity should have the skills and experience necessary to perform tasks/assignments including the ability to use specialized equipment, make decisions, use judgment, and operate effectively in a team environment. The same concerns apply to the contingency resources. Teams should have an adequate number of qualified members from which to choose for any single mission or activity.

Team Fitness

Team fitness considers the physical and mental state of the team. This is a function of the amount and quality of rest a team member has had and basic physical fitness as it relates to the task or mission. Quality of rest considers conditions slept in, potential sleep length, and any interruptions. Fatigue normally becomes a factor after 18 hours without rest; however, lack of quality sleep builds a deficit that worsens the effects of fatigue. Other factors to consider are physical preparedness and personal life factors that may impede the outcome of the operation or activity.

Environment

Environment considers factors affecting human performance and factors affecting the performance of equipment, vehicles, vessels, or aircraft. This includes, but is not limited to, time of day, wind exposure, temperature, humidity, precipitation, elevation, isolation, vertical exposure, proximity to aerial/navigational hazards and other exposures (e.g. oxygen deficiency, toxic chemicals, and/or injury from falls and sharp objects).

Task Complexity

Task complexity considers the time required and the situation. The longer one is exposed to a hazard, the greater the risks. Factors to consider include: how long environmental conditions will remain stable; whether the activity requires specialized skills, whether there are dynamic and changing conditions, or whether team members are required to divide their attention while performing multiple tasks; whether a fast-paced activity and sense of urgency induces stress; whether pre-plans and operating procedures cover a high percentage of the activities, or whether team members must use judgment and experience to respond appropriately to novel circumstances.

ORM Steps
1. **Define mission**
2. **ID Hazards**
3. **Assess risks**
4. **ID Options**
5. **Risk vs. Gain**

Generally, simple, repetitive tasks occurring in highly structured and controlled work environments have the lowest complexity.

Calculating Risk

In evaluating degrees of risk, each evaluator assigns a numerical value between 0 and 10 to each of the elements. Zero represents low risk and 10 represents high risk. This produces a risk scale of 0 to 80; the higher the score, the greater the risk. The following risk calculation worksheet shows how a particular score ranks on the green-amber-red scale. It is important to note that this is a blunt instrument; the process of a team evaluating each element is ultimately just as important as the eventual number attached to it. The following worksheet and scoring sheet shows how the score translates into a relative risk value:

Operational Components	Rating
SUPERVISION	
PLANNING	
CONTINGENCY RESOURCES	
COMMUNICATION	
TEAM SELECTION	
TEAM FITNESS	
ENVIRONMENT	
TASK COMPLEXITY	
TOTAL	

RED (High Risk)	80 61
AMBER (Caution)	60 36
GREEN (Low Risk)	35 0

Once one obtains a risk value, the team must weigh the relative risk vs. the expected benefits of the activity. In cases where risk is in the amber or red categories, one can frequently apply measures to reduce the risk before proceeding. In cases where one simply cannot mitigate the high risk, higher-level supervisors and managers must be part of the decision to proceed, commensurate with the higher level of risk. In this way, upper levels of the organization share in the responsibility and accountability for decisions that put personnel or participants at risk.

ORM Steps
1. Define mission
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Commercial Bicycle Tour Risk Assessment

The team used the Green-Amber-Red (GAR) model to evaluate the operational components of the commercial bicycle tour operations. The team listed observations, based on the way the bicycle tour companies are currently conducting their trips, for each of the operational components. A final 0-10 score (average level of assessed risk) is assigned to each category, listed in parentheses after the category title, and summarized in the risk calculation worksheet that follows.

SUPERVISION (8)

The lead bicycle guide acts as the primary supervisory element during the bicycle tours. The van driver supports the lead guide. The lead guide is responsible for pace setting, monitoring client behavior during the ride, assessing client ability on the check ride and throughout the descent, providing the safety briefing, communicating hazards to the clients during the ride, and making the decision whether to discontinue or adjust the start of the bicycle portion of the tour because of inclement weather.

Feedback from bicycle tour company personnel and others knowledgeable about bicycle tour operations indicated that there could be significant turnover in bicycle guides. Because the guide's ability to determine the overall safety of the trip is so critical, frequent turnover, a lack of depth of experience, and/or a lack of sustained commitment to the values of the company can greatly influence the safety of the clients.

The level of experience, responsibility, and function of the van driver can vary among bicycle tour companies. With all companies, the van driver provides a secondary, but first-line level of supervision that supports the lead guide in a variety of ways in accomplishing the above activities.

Both of these supervisory elements have a primary weakness of dividing their attention between operating a bicycle or vehicle and trying to accomplish supervision of the group. The lead rider is at a particular disadvantage, because he or she must look backwards during the descent in order to observe the conduct and health of the group. One of the more serious recorded injuries to a guide occurred when a guide rode off the road and fractured his pelvis because he was observing the group rather than the road in front of him.

Both supervisory elements also have a disadvantage of proximity to their clients during the descent. Because of the curvature of the roadway, the spacing of the riders, potential weather-related visibility, and the size of the tour groups, it is rare that either guide can observe all or even most of the group at any given time during the ride.

There is no second line supervision built into the field operation for the bicycle tours. We heard from tour companies and the public that the supervision and conduct of the group is entirely dependent on the lead guide and that they operate completely unsupervised in the field. There is a documented history of inappropriate behavior by some guides. This includes conflicts between guides from competing companies, dangerous riding behavior by guides, and conflicts between guides and the public

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that may go unaddressed by a second level of supervision and that ultimately degrade the safety of the operation.

Bicycle tour company employees and former bicycle guides indicated that despite speed being one of the most common contributing factors to client injuries, there is an incentive for guides to maintain a high rate of speed to create a thrilling atmosphere that may increase clients' propensity for tipping. Additionally, when companies pay their guides by the trip, some believe there is a tendency for guides to rush through the ride in order to bankroll a day's wage quickly, leaving a significant portion of their day for other pursuits (including second jobs).

Close and competent supervision including removing visitors from the ride because of a lack of skill or fitness, providing a thorough safety briefing and instruction to the group, coaching and correcting minor mistakes before they lead to accidents, maintaining strict control of the speed of the group, providing frequent rest and food/hydration breaks, and discontinuing a ride because of inclement weather can mitigate many of the factors and conditions that contribute to bicycle mishaps.

PLANNING (6)

It appears that bicycle tour companies provide pre-trip information to clients prior to arrival, which outlines basic logistical information, equipment requirements, timelines, etc. However, this information varies by company and there is still generally insufficient information provided to the clients about the demands, complexity, and risk of the activity that might encourage better self-screening of clients prior to the tour.

The amount of time that clients have from when they book a trip to when they go on the trip varies considerably, and because a high percentage of trips are booked by booking agencies, clients receive inconsistent initial information about the demands and risk of the activity.

The first direct contact with the client that most tour companies have is the morning of the ride when they meet them at their bike shop or when the tour company picks the clients up at their hotel. This creates a short window of opportunity to provide clients all of the information they need for the trip, troubleshoot potential erroneous information that the client may already possess, and screen out clients who lack the skill or ability to participate in the bicycle portion of the tour.

It is not clear that all companies have well-developed training standards/programs for their guides and detailed operating procedures that are consistently known, practiced, and enforced. This leads to inconsistencies in how individual guides run trips, with corresponding inconsistencies in the safety of the clients.

CONTINGENCY RESOURCES (5)

There appears to be good access to the NPS and other law enforcement and emergency medical providers in the event of an accident, including first aid certified guides who are required to have access to basic first aid equipment.

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Clients have ready access to the tour van in the event they need to discontinue the ride.

The score on this element would be lower, but despite ready access to initial emergency care, this activity takes place in a relatively remote environment. Particularly during inclement weather, it can be more than an hour and sometimes up to two hours to definitive medical care at a hospital. With serious injuries, this increases the risk of a more serious or fatal outcome.

COMMUNICATION (7)

Because a high percentage of trips are booked by booking agencies, there is very little control over what information clients receive about the demands and risk of the activity. In fact, because the booking entities generally receive a commission for a booking, there is an incentive to downplay the rigor and risk of the activity in order to book a trip and obtain the commission.

The first direct contact with the client that most tour companies have is the morning of the ride when the tour company picks the clients up at their hotel or when they meet them at their bicycle shop.

A good opportunity to communicate with clients is on the 1.5-2 hour van ride to the crater. However, because of the early departure time, most companies allow their clients to rest and sleep rather than providing them with safety information during the drive. One company stated that they do show an orientation video on the way to the park.

During the ride, the clients spread out and there is little communication between guides and clients or among clients. The guides attempt to use hand signals to indicate curves or hazards, but because of the curvature of the roadway, the distance between clients, and the size of the overall group, it is rare that the guide is within view of all clients at any given time. There is variability in how frequently groups pull off and reassemble, discuss how everyone is doing, identify client needs, etc. Many individuals stated that they routinely travel the entire distance through the park without the group stopping except to walk through the curve near the Kalahaku Overlook.

TEAM SELECTION (9)

Team selection is a fundamental weakness of the entire operation. Because tour companies and booking agencies market these trips widely, a wide range of clients purchase trips. Potential clients include teenage children all the way to elderly individuals who may not have been on a bicycle for decades. A significant factor in most accidents is that the client simply did not possess the skill and ability to operate a bicycle in the environment at the park. Tour company employees, emergency responders, hospital personnel, and clients themselves expressed a common sentiment that the client “should never have been on that bike.”

There appears to be a varying degree of self-screening by clients and bicycle tour companies once clients purchase a trip. The marketing of these trips largely presents them as safe trips in a beautiful environment. During an interview, one bicycle tour

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operator stated that they do not want to scare people off before they have their money. Once the clients are at the top of the hill where, per company policies, they will not receive a refund , there is an attempt to dissuade them from continuing.

From a client standpoint, once they pay for a tour and they are at the park, there is a strong incentive to go through with the bicycle tour despite a lack of skill or suitability for the activity.

We learned from interviews that there are clients who would typically self-screen themselves out of the activity, but are there because of pressure from other family members, often spouses.

Once on the ride, because of the supervisory challenges outlined above, depending on where clients are in the group, there may be very limited opportunities for guides to identify clients having trouble, and even then, a reluctance to pull them from the ride. We heard repeatedly from clients during interviews that there was constant pressure from the guides and other clients to keep moving to prevent being passed by vehicles or other bicycle tours.

TEAM FITNESS (8)

Team fitness is another built in weakness from a safety perspective, particularly because most of the bicycle tours start with the sunrise viewing at the crater. Most clients are therefore getting up at two or three in the morning in order to meet their tour group and drive to the park early enough to reach the crater rim before sunrise. Because most clients are on vacation, it is likely that they have engaged in other activities, had insufficient sleep before their ride, or are adjusting to a new time zone.

Medical personnel, tour company employees, and clients all indicated that clients suffer the effects of a variety of things including lack of sleep, effects of altitude, dehydration, lack of food, poor overall physical fitness, the effects of prescription medication, and the effects of alcohol or recreational drugs.

Because the trip is entirely downhill, clients in poor physical condition may purchase the trip with the belief that there are few physical demands—despite the fact that physical condition influences response to altitude, bicycle handling, coordination, and balance. All of these factors have the potential to degrade their ability to operate a bicycle safely—particularly given some of the challenging, dynamic conditions encountered on the tour.

ENVIRONMENT (9)

This is a complex and demanding environment in which to operate a bicycle. The roadway is only 22 feet in width, has downhill grades of up to 6%, contains numerous sharp curves and switchbacks, and has notable rock debris (particularly during/after storms and during freeze/thaw cycles). Because most bicycle tours occur during the peak visitation period during the early part of the morning, there is often heavy motor vehicle traffic on the road including large tour buses. Weather conditions can be severe and change rapidly. Fog, localized wind gusts, and when cold enough, black ice can appear suddenly and affect the safety of the ride. Weather reports are unreliable and the decision to continue or abort the trip requires judgment and

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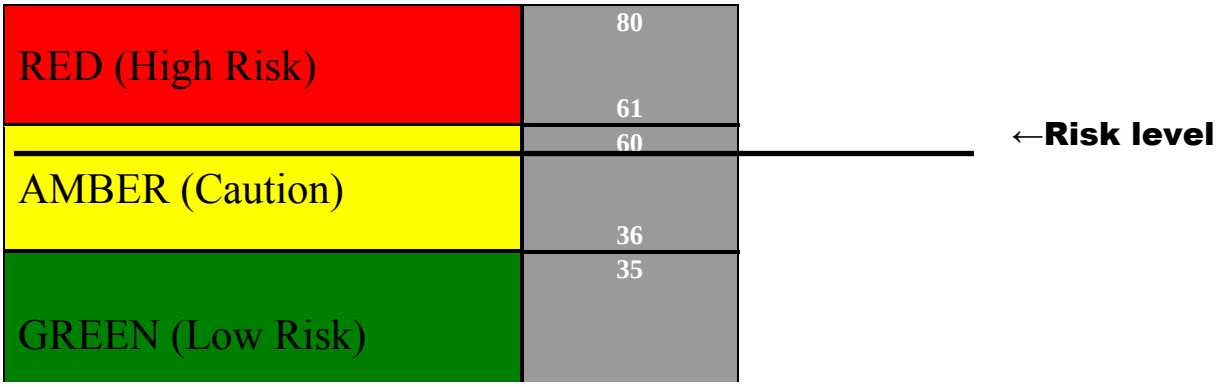
maturity. Because clients have paid and refunds are not available once the clients are at the park, there is a strong incentive for them to continue the trip.

TASK COMPLEXITY (8)

The way the companies operate the tours, and because of the nature of the route, this is an activity with a high degree of complexity for the clients and the guides. Many of the clients have had little if any recent experience on a bicycle, let alone in the dynamic and intimidating environment at the park. The fact that there are so many accidents in so many different circumstances, speaks to this complexity. Clients who have limited recent experience on a bike have to contend with the unfamiliarity of the equipment, potentially inclement weather conditions, rocks in the road, up-bound and down-bound traffic, a narrow roadway with no shoulder, unmarked curbs on the road edge, and an ever-present tension to maintain the pace and not back up traffic. It takes constant concentration and alertness to maintain proper speed, balance, and spacing with other clients. Riders must anticipate road hazards like ice or rocks in the road, keep an eye on passing traffic, and anticipate and negotiate very sharp curves in the road. Overall, a bicycle requires a tremendous amount of alertness and skilled rider input on this type of roadway in this environment.

Risk calculation for current commercial bicycle tour operations:

	Rater 1	Rater 2	Rater 3	Rater 4	Rater 5	Average
SUPERVISION	8	8	8	7	8	8
PLANNING	5	6	6	6	5	6
CONTINGENCY RESOURCES	3	6	7	3	4	5
COMMUNICATION	7	7	9	7	7	7
TEAM SELECTION	9	8	10	8	9	9
TEAM FITNESS	9	8	9	7	9	8
ENVIRONMENT	9	8	10	7	9	9
TASK COMPLEXITY	8	7	9	6	9	8
TOTAL RATING	57	58	68	51	59	60



II. Identify other circumstances that should be considered in determining if this activity can be conducted in a manner that maintains public health and safety and is protective of park visitors.

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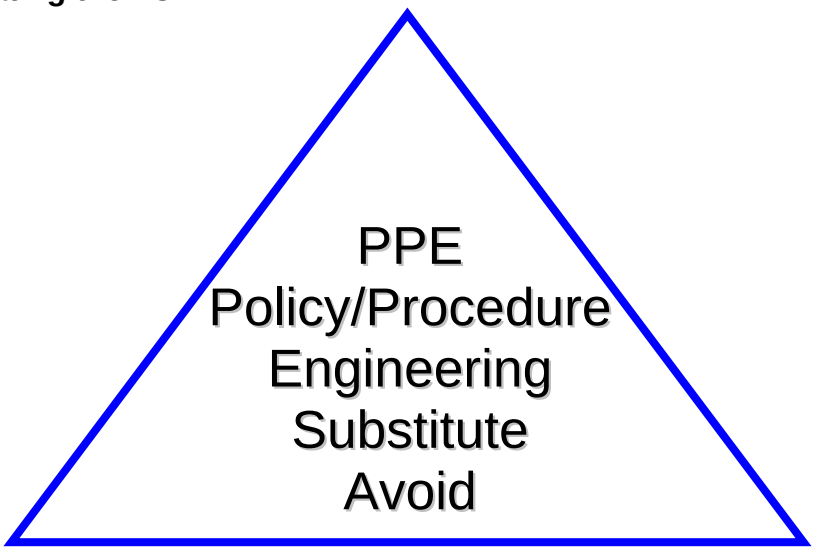
4. Identify Options

Once we know the risk of an activity, we must ask the question: Can we mitigate the risk? Ideally, we would like to find options that have the potential of reducing the expected risk into the "green."

Mitigating the risk



There are five basic categories of mitigations represented in the above pyramid. The measures at the base of the pyramid more decisively eliminate exposure to hazards

and rely less on human behavior (because humans are prone to error). One should consider these first and they will provide a sound foundation for other measures employed farther up the pyramid. At the very top of the pyramid, personal protective equipment should be the last resort because it acknowledges that we cannot avoid exposure to a hazard and are simply trying to prevent the effects of that hazard when we inevitably contact it.

For example, an automobile seat belt is really a measure of last resort in protecting a driver from injury and is no substitute for good driving habits and roadway engineering designed to prevent accidents altogether, rather than simply protecting a driver from the affects of an accident that has already occurred. Likewise, during inclement weather, one is better off to avoid driving or substitute a trip by commuter train, rather than rely on his or her skill as a driver, a seat belt, or even an anti-lock brake system to keep from being injured.

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Options for Commercial Bicycle Tour Options

By considering potential mitigating options for each of the eight risk categories from the GAR assessment, the team looked for an associated connection to or effect on the hazards (threats, errors, factors) identified in Step 2 of the ORM process.

The following table outlines possible mitigating measures for each risk category and connects their effect on the hazards identified in Step 2 of the ORM process. A narrative discussion of each category follows. These should be considered and array of options, some or any combination of which, if implemented, may reduce the risk to bicycle tour participants.

GAR risk category	Options	Rationale	Affects Hazards
Supervision	Reduce group size	Decreases span of control, better observation of client skill and comfort, better control of group speed and spacing	Excessive speed, collisions with other riders, unskilled riders
	Provide second level supervision at launch point	Better guide adherence to policy/procedure, on site individual with stronger investment in company and client safety, evaluation of go, no-go during inclement weather (risk decision shared by higher level of organization, better opportunity to manage conflicts, more senior supervisor to evaluate client abilities and remove clients from ride	Accidents due to weather, unskilled riders, excessive speed
	Increase retention of guides	Increase the skill, experience, and judgment of guides. Increase the consistency of adherence to policy and procedure.	Better management of trip, client screening, go/no-go decision making
	Increase number of guides per trip (e.g. one in front, one in 7th position)	Decreases span of control, better observation of client skill and comfort, better control of group speed and spacing	See above
Planning	Consistent and accurate trip information to clients before trip	Would increase clients' knowledge of risk to self-screen before booking	See above
	Clear training standards/programs for trip guides and detailed operating procedures that are consistently known, practiced, and enforced.	More consistent safety practices by guides	See above
	Limit the number of commercial bicycle tour permits	Criteria for competitively selecting a limited number of permits could place a high priority on business and operating practices that produce the best safety performance.	See above
Contingency Resources	Additional transportation for clients with minor	Ambulances transport some relatively minor injuries because tour companies have no contingency for taking care of them. This ties up	Ambulance available when needed

	injuries	an ambulance that may be needed for a more serious injury	
Communication	Wireless headset communication in all client helmets	Would facilitate better communication between clients and guides (hazards, client needs, upcoming curves, etc.)	Excessive speed, unexpected hazards, accidents where client should have opted for van, but didn't
	More accurate trip information to clients before trip	Would enhance self-screening prior to trip	See above
Team Selection	Better risk information to clients at point of sale	More awareness of rigor and risk would cause better initial client self-screening	Accidents due to rider panic, skill level
	Eliminate third party bookings	Would enhance accuracy of information to clients, self-screening by clients, and screening by tour company	Accidents due to panic, skill level
	Self-screening questionnaire required of all clients prior to trip	Better opportunity to identify client mismatch with activity, health problems, lack of bicycle experience, medications, fatigue, illness, etc.	Accidents due to health, fitness, meds, etc.
	More demanding test ride at base of operation, not on mountain	More opportunity to identify lack of skill and less pressure to go through with ride	Accidents due to rider skill, familiarity with bicycle
	More generous refund policy	More likelihood of unskilled or unprepared clients opting out of the ride at various points leading up to the ride, including while in the park	Accidents due to rider skill, health, fitness, etc.
	2nd level supervisor at launch area	See supervision above	See above
Team Fitness	More aggressive approach to education and self-screening process.	Encourage unfit clients to abandon the trip before they book the trip or are "in the van." Help clients understand risk factors prior to trip so they can prepare.	Accidents due to fatigue, fitness, health problems, meds, etc.
Environment	More structured process for evaluating weather conditions	Go – No Go checklist for evaluating launch point or scrubbing of entire trip. 2nd level supervisor should share in decision—particularly if it's a Go	Accidents due to inclement weather
	NPS sweep road of rocks prior to first bike tour launch	Eliminate some of the rock hazard on roadway particularly after recent rainstorms.	Accidents because of hazards in roadway
	NPS paint curbs	Curbs are difficult to see and present hazards to cyclists.	Accidents because of running into the curbs on the road edge.
Task complexity	Hold bicycle trips at launch area for an hour to allow traffic to clear	Large percentage of traffic leaves crater area immediately after sunrise. Would decrease the pressure to ride at traffic speed and decrease the number of vehicles trying to pass bicycle groups. Would give better opportunity to conduct test rides in parking lot with fewer vehicles and other visitors.	Excessive speed, panic when being passed by cars, distraction by passing cars
	Handouts or better signing to non-bicycling public upon	Would better inform other visitors how to reduce the impact of the bicycle tours on their trip and vice versa.	Accidents due to vehicle encounters, intimidation from

	entry into the park informing them of the bicycle tours, launch times, rules of the road, etc.		angry drivers, distraction, panic
	Require bicycle trips to pull off at every available pullout, not just when large amounts of traffic	Would decrease the pace of the tour. Provide more opportunities for guide/client communication. Would allow clients a break from intensity of concentration. Would allow clients to rest their brake hands. Would allow food/water breaks. Would remove all notions that this is a "thrill ride" rather than a tour of the park.	Excessive speed, fatigue, inattention (watching view), Pressure to keep up
	Brake lights on bikes	Easier to see when bicycle in front is braking	Collisions with other bicycles
	Shuttle system for non-bicyclists*	Reduce overall traffic on road. Could provide another "opt out" alternative for tour participants.	Excessive speed, panic when passed by vehicles, riding too close to road edge, distraction
	Greater time between launches	Would reduce chances of tours passing each other and reduce the pressure to keep pace. Would make it easier for vehicle traffic to pass tour groups.	Excessive speed, vehicle interactions, distraction, panic
	Require bike groups to use every pullout	Reduce number of vehicles passing bikes. This would allow bicycles to use full lane width without fear of being passed by vehicles.	Vehicle interactions, panic, riding too close to road edge, hitting curb, running off road

*In 2004, the park conducted an alternative transportation study. As a result of that study, the park has determined that a shuttle system is not feasible at this time.

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Options for Commercial Bicycle Tour Options

Supervision

Park commercial bicycle tour operations stake a lot on single guides who are in charge of each trip. The span of control in managing a group of 13 riders appears to exceed the capability of the current tour model. This results in poor speed control, guides not able to see or communicate with their entire group, lack of ability to identify poorly skilled riders either during the check ride in the parking lot and/or during the ride. Increasing the guide to client ratio or reducing the group size would improve this risk factor.

In addition, because there is no second level supervisory presence in the operation, there appears to be little accountability or oversight of individual guide adherence to standards, attention to detail, and the balance between generating tips vs. running a conservative trip. Increasing the amount of second level supervisory involvement could improve this. Having a second level supervisor at the launch area could create more of an atmosphere of accountability and oversight and improve the level of experience and maturity available to make decisions about client suitability for the ride and altering or cancelling the trip because of inclement weather.

Planning

Although bicycle tour companies provide pre-trip information to clients prior to arrival the information varies by company and there is still generally insufficient information provided to the clients about the demands, complexity, and risk of the activity that might encourage better self-screening of clients prior to the tour.

Clear, consistent information regarding the complexity, demands and skill level required for the trip coming from the bike companies as well as booking agencies could greatly reduce unskilled and ill-prepared clients from deciding to participate in the activity.

There is minimal planning opportunity for a client who knows little about the risk of the ride and whose first direct contact with the bike company is the morning of the ride. Tour guides should receive clear guidance and information about how to better screen out clients who lack the skill or ability to participate in the bike tour. Well developed training standards and programs for their guides and detailed operating procedures that are consistently known, practiced, and enforced by bike companies will enhance planning to mitigate potentially hazardous situations.

Limiting the number of commercial bicycle tour permits could serve as a tool to select bike companies through competition that have business and operating practices that have the best safety practices and records.

Communication

The team identified two important areas of potential improvement. The first is to improve the accuracy of information that clients receive before their trips, preferably at the point of sale. Currently, the demands and potential risks are either

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downplayed in order to make sales or omitted because of a lack of information about the activity. This results in a potentially unqualified pool of clients for the trips.

Second, once the trips have left the staging area, it is extremely difficult for clients and guides to communicate during the ride. Wireless two-way electronic communication devices within the client helmets, more frequent stops during the ride, and a smaller group size could potentially improve this communication.

Team Selection

A critical element that leads to bicycle tour injuries is clients who simply do not possess the skills and abilities necessary to operate a bicycle safely in the environment at Haleakalä National Park. A more aggressive self-screening process for potential clients and a more aggressive screening process by the tour companies could improve this. This would require more accurate and detailed information about the trips at the point of sale and with first contact with the tour company.

The current check ride around the parking lot does not adequately evaluate the skills and abilities required to complete the ride. The pace, grade, and curvature are completely different from what is encountered on the ride. In addition, for the early morning tours, the parking lot is so full of bicycle tour clients, members of the public, and motor vehicle traffic that it is impractical, disruptive, and dangerous to conduct the check ride in this location. A more thorough check ride that would require significant braking and bicycle handling skills could be developed and administered at the tour company's base of operation rather than up at the top of the ride. That would also put clients in a better position to pass on the trip entirely or elect to ride the van only.

An established refund policy that gives the client some options would help facilitate this process and allow clients to base their decision more on their personal safety rather than on financial considerations.

Team Fitness

Client fitness is a difficult element to control. Tour companies could influence this by developing a more thorough client self-screening and education process that highlights for visitors the risks associated with the activity and the effect of personal conditions such as fatigue, medical conditions, medications, recreational drugs, etc.

The 1999 review suggested developing a video that accurately depicts the conditions and setting of the ride that all potential clients could be required to view before embarking on the trip.

As was indicated during interviews with tour company employees, the fine line for them is between accurately portraying the risks and consequences and steering some unskilled/unprepared clients away from the ride vs. driving everyone away and making it difficult for tour companies to make a profit.

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Environment

Although one cannot easily control the physical environment, this area does provide some opportunities to improve the safety of this activity. Inclement weather can create unsafe conditions for bicycle tours. During interviews, numerous individuals indicated that bicycle tours routinely operate during degraded conditions that include black ice on the road, fog, high winds, and precipitation. A more structured and rigid way of making the Go – No Go determination could create an environment where decisions routinely err on the side of caution rather than on the side of finishing the trip. Alternatives like starting the bicycle portion of the tour at a lower elevation during certain conditions are good options short of cancelling an entire trip.

Rock debris on the roadway is another hazard that produces accidents—particularly after recent precipitation. Periodic use of a pull-behind road sweeper by the NPS could mitigate this hazard within the park.

An approximately four-inch square, black asphalt curb used to channel water intermittently lines the road through the park. The curb blends in with the color of the road and is difficult to see—particularly when it is in shadow. The squared edges can pose a hazard to cyclists. The 1999 report recommended painting the curbs so that they are more visible to riders. Accident reports indicate that the curbs are a factor in bicycle accidents. Painting the curb a brighter color (even white) would likely improve riders' ability to identify them as a hazard and avoid close contact with them. This could benefit motor vehicle drivers as well during times of limited visibility.

Task Complexity

This activity is extremely complex for clients who possess a wide range of skills and experience, particularly in a physical environment that poses frequent hazards and opportunity for error than can lead to injury or death. Aside from the environmental conditions discussed above, much of the complexity relates to the speed of the descent and the pressure and distraction of competing with vehicle traffic for use of the road.

According to the 1999 root cause determination, speed was one of the primary root causes of bicycle accidents. Slowing the speed of the bicycle tour groups could significantly improve the safety of this activity. However, this involves an interrelated mix of mitigating factors that would include: increased training and oversight of the guides (which was addressed under supervision); requiring groups to pull off the road at every pullout to reassemble and create a more leisurely approach to the descent; and reducing the pressure to go fast that is generated by vehicles backing up behind groups and the anxiety of having vehicles pass the group while they are moving.

A requirement that all bicycle groups use every pullout, coupled with better enforcement of the current no-passing zone through the park, could reduce anxiety for bicyclists and motorists alike. Motorists could wait behind groups knowing that they would pull off the road frequently to allow passing, and bicycles would know that it is acceptable to go slower, given that traffic will have known opportunities to pass at every pullout.

If bicycle trips remained an hour or so at the crater, a significant amount of the sunrise-viewing traffic could proceed down the hill prior to the first bicycle group. If this information were communicated to drivers through a handout or appropriate signing as they enter the park, they could plan accordingly and either leave ahead of the groups, or understand that they cannot pass the bikes while they are moving, but with the assurance that groups will pull over at every pullout.

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Laying the Foundation for Evaluating Risk vs. Gain

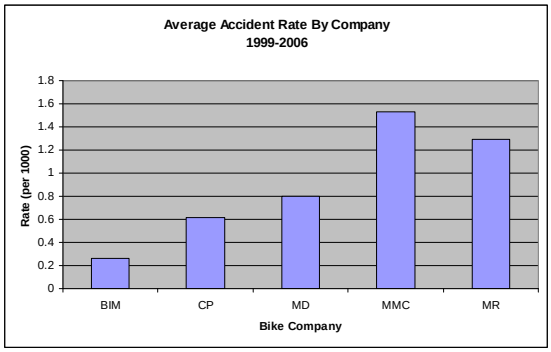
The Board of Review will ultimately weigh the relative benefits and practicality of implementing any of the above options based on the expected reduction in risk that any given option might provide and the overall effect of these actions not just on the bicycle tour operations, but also on other visitors to the park.

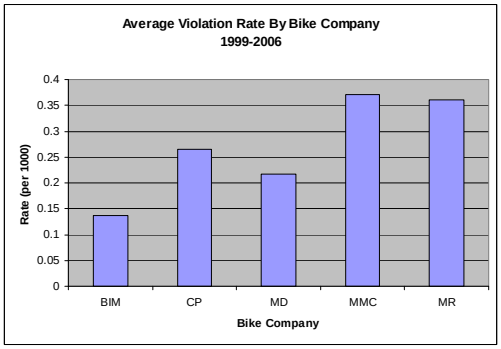
III. Assess permit requirements for these operations, and determine if these companies have been compliant with safety requirements.

Evaluating Permit Compliance

Many of the above options would require the NPS to place additional management controls on the bicycle tour companies. The park would implement these through its permitting authority. Success of any of these measures in mitigating risk depends on the willingness of bicycle tour companies to comply with any new management controls. Some of these may require the bicycle tour companies to change their business and/or operating model to effect the appropriate changes.

With that in mind, the team reviewed the current permit conditions and the existing tour companies' compliance with those conditions. In addition, we looked at the correlation between accident rates and citation rates as represented in the below graphs:





Based on the data we analyzed, there is a weak correlation between violations and accident rate. However, according to the data, rangers issued a high percentage of the documented citations and warnings for vehicle violations, which based on the accident and injury data, have accounted for no client injuries in our data set.

On the other hand, there are very few warnings or citations for violations of bicycle-related permit conditions including rider spacing, group size, rider PPE, failure to allow vehicles to pass, launch intervals, etc. On the surface, this would indicate good compliance with the management controls specified in the permit and a likelihood of complying with additional requirements.

IV. Given the design/alignment of park road, assess if road can safely accommodate downhill bike tours along with all other public and administrative uses and is such use sustainable for the park.

The Central Federal Lands (CFL) Traffic and Safety Team of the U. S. Department of Transportation, Federal Highways Administration conducted a safety review of the main roadway in Haleakalä National Park. They recommended areas to look at and strategies that might reduce bicycle accidents in the park. We considered those recommendations and many of the above alternatives are based on or consistent with their recommendations.

Concerns about the road suitability will fall to the Board of Review when considering various alternatives to managing commercial bicycle tours and the effect they have on other visitation. For example, in this report, we identified options including holding bicycle traffic longer at the launch area to allow sunrise-viewing traffic to descend ahead of the bicycle tours, requiring bicycles to pull off the road at every available opportunity to allow traffic to pass, and prohibiting motor vehicles from passing bicycle groups unless pulled off the road at a pullout. If the park ultimately finds that those are viable options, consistent with other visitor activities and park purposes, then there is the potential for reducing the risk to bicycle tour participants.

Conclusion

As reflected by the number of accidents, injuries, and the risk assessment score, the commercial bicycle tours at Haleakalä National Park, as currently operated and managed, pose moderate to high risks to the tour participants. In evaluating the identified risk categories, the team has identified options that if implemented, have the potential to reduce the risk of this activity and ultimately decrease the accident and injury rates.

Although there may be concern that implementing the operational changes required to make the activity safer could increase the cost of providing bicycle tour services in the park, it is clear from the tour company accident records that good safety practices of companies with the lowest accident rates did not seem to limit the ability to attract customers and run a profitable business. Since the market has not driven the bicycle tour companies to improve their practices to increase safety, then the park has an opportunity and a responsibility to provide that incentive.

The safety review team believes that there are sufficient options that if implemented would significantly reduce the risk of this activity.