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TRAVEL AND TOURISM IN AMERICA TODAY

HEARING

BEFORE THE

SUBCOMMITTEE ON
COMMERCE, TRADE, AND CONSUMER PROTECTION

OF THE

COMMITTEE ON ENERGY AND
COMMERCE
HOUSE OF REPRESENTATIVES

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TRAVEL AND TOURISM IN AMERICA TODAY

WEDNESDAY, APRIL 30, 2003

HOUSE OF REPRESENTATIVES,
COMMITTEE ON ENERGY AND COMMERCE,
SUBCOMMITTEE ON COMMERCE, TRADE,
AND CONSUMER PROTECTION,
Washington, DC.

The subcommittee met, pursuant to notice, at 1:07 p.m., in room 2123, Rayburn House Office Building, the Hon. Cliff Stearns (chairman) presiding.

Members present: Representatives Stearns, Shadegg, Bass, Issa, Otter, Tauzin (ex officio), Schakowsky, Brown, Green, and Strickland.

Staff present: Kelly Zerzan, majority counsel; Ramsen Betfarhad, majority counsel; Jill Latham, legislative clerk; and Jonathan J. Cordone, minority counsel.

Mr. STEARNS. Good afternoon. Welcome to the Subcommittee on Commerce, Trade, and Consumer Protection.

The subcommittee will come to order, and without objection the subcommittee will proceed pursuant to Committee Rule 4(e).

So ordered.

The Chair recognizes himself for an opening statement.

Good afternoon and welcome to the Subcommittee on Commerce, Trade, and Consumer Protection hearing on travel and tourism in America today. I want to thank sincerely the witnesses for appearing before the committee. I know how busy you are.

This is our first hearing on this subject in the 108th Congress, but I am confident this will not be our last.

Beginning with our hearing less than a month after the horrific, terrible events of September 11, 2001, myself and our staff have been examining the state of the U.S. travel and tourism industry as it continues to recover from the downturn in travel since September 11. During this recovery period, the industry has faced other challenges, such as the war in Iraq and most recently the SARS epidemic.

I noted the U.S. News & World Report. On the cover of their issue it says, "SARS Hits Home: How it spreads, where it came from and how to fight it." This type of publicity is not good for the tourist industry.

So at a time when the industry faces serious challenges, most not of its own doing, we are holding this hearing first to highlight the significance of the industry to our economy so that Americans understand.

Second, I hope that the hearing creates a good record as to what are the problems in the industry today and what, of course, specifically needs to be done to cure these ills. I hope to learn what we as Federal policymakers can do to make the United States a travel destination of choice for international travelers.

Now, permit me to cite some sobering facts that clearly underline why this industry is very significant and, as such, worthy of careful consideration by Federal policymakers like ourselves. The travel and tourism industry employs both directly and indirectly nearly 1 in every 7 Americans, some 18 million people. It generates over $5 billion in economic activity every year.

Travel and tourism is one of the top 3 industries in 29 States, including my home State of Florida. In fact, the more than 40 million visitors a year to Florida generate about $40 billion, the single largest source of income from our State.

Making the United States a travel destination of choice for international tourists is extremely important. One fact illustrates the significance of international travel best. In the United States, an international visitor spends four times as much as a domestic traveler. That is one reason we have a balance of trade surplus in travel and tourism.

While the trade deficit of the United States has steadily risen to where it is in 2002, the imbalance reached an all time high of $435 billion. The travel and tourism industry has consistently been the largest sectorial contributor to our balance of trade surpluses in services.

Yet our balance of trade surplus for travel and tourism, indeed, has fallen from the high of $26 billion in 1996 to $8.6 billion in the year 2001, still representing 12.5 percent of the total services surplus.

The fact that the industry generates a balance of trade surplus, yet we see a 70 percent decline in that surplus in a period of just 5 years is a very telling story, underscoring the need for the serious attention I believe by Members of Congress.

The bottom line is that international visitors are a key to the health of the industry and, indeed, our balance of trade. The United States is now the third most visited travel destination in the world, behind France and Spain. There is no reason, my colleagues, why it cannot be the first.

Just this session of Congress, we appropriated $50 million to the Department of Commerce for a comprehensive international destination marketing campaign. In my view this is an important first step. If those funds are used effectively with an input from industry through the legislatively mandated United States Travel and Tourism Promotion Advisory Board, I think that Congress should make the one time appropriation an annual one.

Spain, just for example, in 1997 spent 3 times as much, $150 million, promoting itself as an international travel destination. As the Spanish economy is less than 5 percent of our economy, I think if well spent, $50 million is a small sum to pay for touting the natural beauty, cultural richness of our country to these international travelers.

And finally, my colleagues, I think we need greater coordination at least at the Federal level with respect to the development and

execution of a national tourism policy. Therefore, I have written to the Commerce Secretary Evans in support of the creation of a Presidential Advisory Council on Travel and Tourism. The council would be comprised of experts from the private, public, and nonprofit sectors, and would serve in an advisory capacity to the Secretary and the President on national tourism policy and development.

The council's key role, in my view, should be fostering a cohesive tourism policy at the Federal level. The experience of my own State of Florida in developing cohesive tourism promotional policies has been most instructive.

So I want to thank the witnesses again and look forward to their testimony, and with that I recognize the distinguished Ranking Member from Illinois for an opening statement.

Mr. SCHAKOWSKY. Thank you, Mr. Chairman.

I appreciate your convening this hearing today to examine one aspect of the faltering U.S. economy, the travel and tourism industry. The workers who depend on this industry for their livelihood and the consumers who depend on this industry for their business and personal travel needs justify the serious attention of the Congress to this important issue.

I come from Chicago, and it is an area and a city that welcomes tourists from all over the world, and we certainly want to see a strong travel and tourism industry.

I am disappointed that we do not have a witness here to specifically address the impact of the current economy on consumers. I am looking forward to hearing from each one of you who is here today.

I believe there are several factors contributing to the decline in business and tourism travel in the United States and the downturn in the U.S. economy in general. Clearly, September 11 had a dramatic impact on the travel industry. SARS has had a chilling effect on travel. The war in Iraq has also had an impact on the flying public and the traveling public. Understandably, many Americans believe that our preemptive military action in Iraq has added to the resolve of those who wish to harm us.

I have heard from constituents who have found the courage to return to the skies after 9/11, but are again fearful of the potential response to our military action in the Middle East.

Many of us oppose the administration's war against Iraq because we did not believe that America would be better off in many respects as a result. As the Chairman indicates, international tourists in the United States spend 4 times the amount domestic travelers spend.

It is not entirely surprising to me that residents of some countries are not eager to come to the United States today, one, because of the widely perceived idea that the United States disrespected world opinion and, two, because of the assault on civil liberties and immigrants and visitors from certain foreign countries that have been initiated by this administration.

One of the casualties, I believe, of the Iraq war and other Bush administration policies appears to be the travel and tourism industry. While 9/11 and the war in Iraq have hurt the U.S. economy,

the one single factor that has led to the economic decline, in my view, is the President's tax cut.

I realize that the tax cut is not the subject of today's hearing, and I will not belabor the point, but I do want to say that I think any complete discussion of factors contributing to our current economic conditions should include a discussion of the negative impact the President's tax policy has had on our economy and outlook for a strong recovery, including the industry that we are focusing on today.

I appreciate the opportunity to hear from our witnesses. I am eager to discuss ways that we can help the workers and consumers who rely on the travel and tourism industry for their livelihood and other important needs.

Thank you, Mr. Chairman.

Mr. STEARNS. I thank you.

And the gentleman from New Hampshire, Mr. Bass, is recognized.

Mr. BASS. Thank you very much, Mr. Chairman, and I appreciate your holding this hearing, which I think is the second one that we have had since I have been on the subcommittee, and it is a very relevant and important topic.

I recall in the last hearing a discussion about the impact of 9/11 on tourism in various parts of the country, and I noted at that time that my home State of New Hampshire actually was doing possibly better as a result because there were few people flying longer distances. New Hampshire is a destination for people who do not have to fly or move great distances, and our tourism is doing pretty well.

And as I mentioned then, New Hampshire's economy ranked 7th in our reliance on travel and tourism, and it brings in close to $9 billion a year. So certainly this is an important and relevant subject for me.

However, I do believe that the SARS epidemic or the potential to have one is going to be quite different in its impact on various regions of the country. It may hurt us all the same, but I hope that we as policymakers and those of you who are testifying today could be very sensitive to the fact that this is an issue that is going to affect every sector of the economy potentially in this country if we cannot move together with a unified plan to deal with it, and the tourism industry may be hurt first more than anybody else.

So thank you for holding this hearing, Mr. Chairman. I look forward to hearing the words of our witnesses.

I yield back.

Mr. STEARNS. I thank my colleague.

The gentleman from Ohio is recognized.

Mr. BROWN. Thank you, Mr. Chairman, for scheduling today's hearing.

Thanks to our witnesses for joining us.

I share the sentiments of our Ranking Member, Ms. Schakowsky, and her concerns that the President's tax cut is causing even larger budget deficits. Tax cuts that go overwhelmingly to the wealthiest of our citizens while cutting vital programs can have a negative impact on travel and tourism, as on much of the rest of the economy.

Tourism provides in my own State of Ohio hundreds of thousands of jobs. Travelers spend billions of dollars in Ohio every year. That is one reason I share the concern of the Chairman and our witnesses today about the condition of America's travel and tourism industries.

Another reason is because many of the issues that have become critical to the economic health of tourism and travel are also critical to public health and public safety. I am thinking here of issues like homeland security and infectious diseases and bioterrorism and food safety and security.

Mr. Sternberg, I was pleased to hear the comments that you are raising in your testimony about food safety and food security on behalf of the National Restaurant Association. As the ranking Democrat on the Health Subcommittee, I work closely with the Majority in bipartisan bioterrorism legislation. I consider food security provisions an essential component of the public health security in the Bioterrorism Preparedness and Response Act.

Like many advocates of effective food safety, I was troubled to learn that some of America's food companies had been working to actually weaken food security rules proposed by the U.S. Food and Drug Administration, characterizing them as proposals for efficiency and flexibility.

Some in the food industry have recommended that shipments of imported foods be welcomed into the United States with practically no advanced notice and with no assurance at all that a shipment's contents match the manifest provided to Federal officials, in direct contradiction to legislation this subcommittee, the full committee, and the House and Senate passed last year.

That does not sound to me like the sort of food security system that would give visiting diners or American families traveling or American homes very much confidence.

This committee has a responsibility to insure that Americans are protected by an effective food security system, and unlike tax proposals and other remedies recommended by some of our witnesses, insuring an effective food security system is something that this committee can do.

Mr. Chairman, I think the Energy and Commerce Committee needs to take a close look at the implementation of the bioterrorism law's food safety provisions. I hope you will join me in calling for oversight hearings on this important issue.

I yield back the balance of my time.

Mr. STEARNS. I thank my colleague.

And the distinguished vice chairman of the subcommittee, the gentleman from Arizona, Mr. Shadegg.

Mr. SHADEGG. Mr. Chairman, in deference to our witnesses and having complimented you for holding an important hearing, and a hearing I talked about this morning on television, talking about the impact on this industry and its importance to our Nation, as well as my State of Arizona, I will waive an opening statement.

Mr. STEARNS. I thank my colleague.

And the gentleman, Mr. Green.

Mr. GREEN. Thank you, Mr. Chairman.

I would like to get on to the witnesses, and I would like to put a statement into the record. I appreciate you calling this hearing,

and our Ranking Member, because of the concern I think all of us have not only nationally, but locally.

Thank you.

[The prepared statement of Hon. Gene Green follows:]

PREPARED STATEMENT OF HON. GENE GREEN, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF TEXAS

Thank you Chairman Stearns and Ranking Member Schakowsky for holding this hearing and giving us the opportunity to discuss the situation facing America's travel and tourism industry.

The travel and tourism industry has historically been one of the stronger sectors of our economy, creating an $8.6 billion annual surplus in the balance of trade.

This industry also employs nearly 18 million Americans and provides about $100 billion in federal, state and local tax revenues.

In my state of Texas alone, travel and tourism generate approximately $40 billion in direct spending, which accounts for more than 5 percent of the state's GSP.

In fact, Texas currently ranks third among all states in total domestic spending on travel and tourism, trailing only California and Florida.

It is difficult to overemphasize the importance of travel and tourism to our economic health, since effects on the industry reverberate throughout the nation's economy.

When visitors travel less, our transportation systems certainly feel a shock, but our restaurants, hotels, parks, small businesses and their employees also take a huge hit.

Unfortunately, the travel and tourism industry is still reeling from the economic consequences associated with September 11th.

That tragic event created tremendous uncertainty in the minds of Americans—a feeling that has only been exacerbated by a weakened economy, a war in Iraq and now the outbreak of Severe Acute Respiratory Syndrome, or SARS.

The result has been a dropoff in travel by Americans and international visitors alike, who have chosen to postpone their trips for better times.

We in Congress have responded by granting the airlines financial relief, both after September 11th and, more recently, in the supplemental appropriations bill passed earlier this month.

That bill also contained funding to market the United States as a premier travel destination.

But more needs to be done.

The United States continues to be a world-class destination for travel.

No other country can boast the diverse set of attractions that we are so fortunate to possess.

From our coasts to our mountain ranges, from our national parks to our first-rate metropolitan cities, America has it all.

And America is safe.

Our task now is to determine how best to lure visitors to our country's tourist attractions and get this industry moving again.

I thank each of you for appearing today before the subcommittee to inform us of your experiences and suggestions for recovery, and I look forward to hearing your testimony.

I yield back the balance of my time.

Mr. STEARNS. I thank my colleague.

[Additional statement submitted for the record follows:]

PREPARED STATEMENT OF HON. BARBARA CUBIN, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF WYOMING

Thank you, Mr. Chairman, for holding this timely hearing.

I would like to welcome the distinguished panel of witnesses. Your insight today will be a valuable contribution to the ongoing examination of our country's tourism industry and efforts to continue to remedy the situation.

Our country is operating under never before seen circumstances. The impact of recent events has been felt in every realm of life as we know it. Necessary steps have been taken in response to these events; now further action of a proactive and stimulative nature is needed.

Every state can identify specific ways in which they have felt the strain on their economies due to a decline in travel and tourism. This issue is something that unites the diverse demographics of our country.

In my home state of Wyoming, the easy-going lifestyle and wide-open beautiful spaces are attractive to travelers who seek a respite from the hectic daily live that so many lead. Once they cross the state line into Wyoming there are numerous options available for recreation, entertainment and accommodation. Getting here is where patrons tend to encounter difficulties.

While many travelers take to the open road when visiting Wyoming, there are those who prefer to fly. We are all aware of the tumultuous state of affairs in the airline industry. Allow me to briefly shed some light on the tremendous hurdles patrons of and residents in my home state continually face.

The limited availability of carriers who even operate in Wyoming is the first hurdle encountered. Finding a seat on these few flights is the second and compounding all of these factors is the outrageous price one must pay for the "convenience" of flying.

Another area of particular concern to me involves members of Wyoming's small business communities—travel agencies. In general, small businesses are the backbone of so many rural communities in my state. The devastating affect that declines in both international and domestic tourism have had on them deserves our attention and commitment to remedy.

It is my hope that today's hearing will shed some light on ways the entire country can encourage international and domestic travelers alike to visit our many attractions.

Thank you, Mr. Chairman and I yield back the remainder of my time.

Mr. STEARNS. I think what I would like to do before I introduce the panel is the Travel Business Roundtable has put together a little commercial which is geared toward encouraging Americans to take domestic travel. I would like to play this commercial for the benefit of my colleagues and the witnesses, who probably have already seen it.

If we can, let's play this, and the people you will see are the Lone Star Band. It is a country and western band who is introducing this. So without further ado, we will have this small commercial before we start.

The Lone Star Band is one of President Bush's favorite groups.

[A video was shown.]

Mr. STEARNS. Well, that was very nice. I think most of us were looking to see if our State was adequately represented.

I want to thank staff for having this to work so well. Sometimes when you start these movies they do not work for some reason. So I want to thank staff.

Now we will go to our panel here, and we are going to go from my right to my left. So I welcome Mr. Rolf Lundberg, who is Senior Vice President, Congressional and Public Affairs for the U.S. Chamber of Commerce.

I want to welcome my good friend, Mr. Jim May, who is President of Air Transport Association, his new position.

Mr. Bill Edwards, Jr., Vice President and General Manager of the Washington Hilton and Towers. He is also chair of the Government Affairs Committee of the American Hotel and Lodging Association.

Mr. Clark Robinson, President, International Association of Amusement Parks and Attractions.

Mr. Michael Sternberg, Chief Executive Officer of Sam & Harry's, the Caucus Room. All of us know where that is and have been to those facilities here in Washington. He is also representing the National Restaurant Association.

And Mr. Paul Ruden, Senior Vice President for Legal and Industry Affairs, the American Society of Travel Agents.

And Mr. Matthew Walker, General Vice President, Hotel Employees and Restaurant Employees International Union.

Let me welcome all of you, and we will start with you, Mr. Lundberg, for your opening statement.

STATEMENTS OF ROLF LUNDBERG, SENIOR VICE PRESIDENT, CONGRESSIONAL AND PUBLIC AFFAIRS, U.S., CHAMBER OF COMMERCE; JAMES C. MAY, PRESIDENT, AIR TRANSPORT ASSOCIATION; WILLIAM H. EDWARDS, JR., VICE PRESIDENT AND GENERAL MANAGER, HILTON WASHINGTON & TOWERS; J. CLARK ROBINSON, PRESIDENT, INTERNATIONAL ASSOCIATION OF AMUSEMENT PARKS AND ATTRACTIONS; MICHAEL STERNBERG, CHIEF EXECUTIVE OFFICER, SAM & HARRY'S, THE CAUCUS ROOM; PAUL M. RUDEN, SENIOR VICE PRESIDENT FOR LEGAL AND INDUSTRY AFFAIRS, AMERICAN SOCIETY OF TRAVEL AGENTS; AND MATTHEW S. WALKER, GENERAL VICE PRESIDENT, HOTEL EMPLOYEES & RESTAURANT EMPLOYEES INTERNATIONAL UNION

Mr. LUNDBERG. Thank you, Mr. Chairman, Ranking Member Schakowsky, members of the subcommittee.

My name is Rolf Lundberg. I am Senior Vice President for Congressional and Public Affairs at the U.S. Chamber of Commerce.

The U.S. Chamber of Commerce would like to thank the subcommittee for holding this important hearing, and we are, indeed, pleased to have the opportunity to testify. If I may submit my full statement for the record, I will just summarize.

Mr. STEARNS. By unanimous consent, so ordered.

Mr. LUNDBERG. Thank you, Mr. Chairman.

The U.S. Chamber is the world's largest business federation, representing over 3 million businesses of every size, sector, and region across the country.

Just this past April 9, the U.S. Chamber of Commerce co-hosted with the Travel Business Roundtable, who produced the video that we just saw, a major travel and tourism summit entitled "Reigniting Growth in Travel and Tourism." It was an effort to focus a very bright spotlight on one of the most urgent economic issues of our time, the revitalization and growth of travel and tourism within the United States and around the world.

That summit, which was the largest of its kind in nearly a decade included participants from all over the various sectors of the travel and tourism industry and brought together more than 200 CEO, senior level executives, along with 3 cabinet members, congressional leaders, mayors from cities across the country, and senior administration officials.

The U.S. Chamber will continue to devote significant resources in this way to finding a solution for the travel and tourism industry's difficulties because travel and tourism is an indispensable component of the overall U.S. economy. Indeed, the stakes are high and the challenge is very clear.

The travel and tourism industry, which includes airlines, hotels, restaurants, resorts, theme parks, museums, rental car companies, travel agencies, on and on, contributes nearly $100 billion in tax revenue at the Federal, State, and local government level and, as

you noted, Mr. Chairman, employs nearly 18 million persons in the United States.

Additionally, the U.S. economy realized an annual balance of trade surplus from travel and tourism of $8.6 billion in 2001, which as you noted also, Mr. Chairman, declined significantly from the surplus that was recorded in 1996, which was as high as $26 billion, which is a 70 percent decline.

It is, however, one of the few industries that consistently generates multibillion dollar surpluses for this country in the balance of trade account.

As the travel and tourism industry faces unprecedented challenges in the wake of September 11, economic uncertainty, the war in Iraq, and most recently the outbreak of SARS, the serious difficulties facing the various sectors of travel and tourism are obvious.

Another victim of the sluggish travel and tourism industry is the small business sector, which is directly and indirectly affected from the lull in travel and tourism. Small businesses, those with under 100 employees, account for more than 96 percent of the membership of the U.S. Chamber of Commerce.

With the contributions of the small business sector to the economy, the Chamber wishes to note the dramatic impact that the decline of travel and tourism has had on small businesses that service and supply the travel and tourism industry. When travel slows, small businesses suffer the most because they do not have the ability to weather a long decline in business.

Let me just summarize some of the recommendations, Mr. Chairman, that the U.S. Chamber would make.

First of all, we believe that the first step to revitalizing the slowed travel and tourism industry is simply to restore confidence in American travel and confidence in people to travel.

Second, the Chamber supports an increase in the promotion of America in other countries. The Chamber applauds the Congress and President Bush for the appropriation of that $50 million to the Department of Commerce for fiscal year 2003 for the comprehensive international destination marketing campaign.

We look forward to the work of the Advisory Board at the Department of Commerce, and we also support the establishment of a separate Presidential advisory council on travel and tourism.

And we thank you, Mr. Chairman, for your letter to Secretary Evans on that subject.

Yet another factor that will assist the recovery of the travel and tourism industry is the strengthening of the American work force. We are supportive of legislation signed by President Bush reauthorizing the work opportunity tax credit through the end of this year. Doing so continues to help employers provide work for unskilled and disadvantaged workers.

And then another means of encouraging travel within the United States would be the passage of legislation in this Congress that would fully restore the business meal and entertainment tax deduction, which currently sits at 50 percent. The reduction of this tax deduction has negatively affected the restaurant and entertainment industries and travel and tourism overall and has been particularly punitive to the small business community.

So in conclusion, Mr. Chairman, the Chamber remains committed to working with the Congress, with all sectors of the travel and tourism industry in an effort to revitalize the industry as a whole. We would like to thank the subcommittee for focusing attention, again, on the economic impact of the industry, the United States, and we want to work with the subcommittee as it continues to examine issues related to the growth of the industry and considers policies to stimulate the revival of travel and tourism.

And I would, of course, be happy to answer any questions, Mr. Chairman.

Thank you.

[The prepared statement of Rolf Lundberg follows.]

PREPARED STATEMENT OF ROLF LUNDBERG, SENIOR VICE PRESIDENT, CONGRESSIONAL AND PUBLIC AFFAIRS, U.S. CHAMBER OF COMMERCE

OVERVIEW

Good afternoon Chairman Stearns and Ranking Member Schakowsky, and members of the Subcommittee on Commerce, Trade, and Consumer Protection. My name is Rolf Th. Lundberg, Jr., and I am Senior Vice President for Congressional and Public Affairs at the U.S. Chamber of Commerce. The U.S. Chamber of Commerce would like to thank the Subcommittee for holding this important hearing, and we are pleased to have the opportunity to testify on the current state of the U.S. travel and tourism industry.

The U.S. Chamber of Commerce is the world's largest business federation representing over three million businesses of every size, sector and region. Our member companies and their millions of employees have suffered the burden of a weakened economy. Since the events of September 11, that burden has been particularly felt in the travel, tourism, and hospitality sectors, many of which are small businesses.

The stakes are high and the challenge is clear. Few domestic industries generate jobs and economic growth like travel and tourism. One out of every seven people (or nearly 18 million people) in the U.S. private-sector workforce is employed directly or indirectly in travel and tourism related jobs. On April 9, 2003, the U.S. Chamber of Commerce co-hosted, with the Travel Business Roundtable, a major travel and tourism summit titled Re-Igniting Growth in Travel and Tourism. We used the summit to bring people together to help focus a very bright spotlight on one of the most urgent economic issues of our time: the revitalization and growth of travel and tourism in the U.S. and around the world. The summit—the largest of its kind in almost a decade—included participants from all sectors of the travel and tourism industry and brought together more than 200 CEO and senior level executives along with three Cabinet Secretaries, congressional leaders, mayors from cities across the country and senior Administration officials. Our summit helped all of us recognize and highlight the fact that drop offs in travel and tourism are affecting broader elements of our economy. State and local governments are losing tax revenue, small businesses are hurting, and our balance of trade is suffering.

The travel and tourism industry includes airlines, hotels, restaurants, resorts, theme parks and museums, rental car companies, travel agencies, and other industries and contributes nearly $100 billion in tax revenue to federal, state, and local governments. With states and localities suffering their worst budget deficits in half a century, travel and tourism-generated funds are critical for providing essential services such as health care, education, and transportation system improvements.

Additionally, the U.S. economy realized an annual balance of trade surplus from travel and tourism of $8.6 billion in 2001, however that surplus was a 70 percent decline from a $26 billion trade surplus in 1996. It is one of the few industries that consistently generate multi-billion dollar trade surpluses.

As the travel and tourism industry faces unprecedented challenges in the wake of the September 11 tragedy, economic uncertainty, the war in Iraq, and most recently the outbreak of the Severe Acute Respiratory Syndrome (SARS), the serious difficulties facing the airlines, hotels, cruise lines, and theme parks are obvious.

Another victim of a sluggish travel and tourism industry is the small business sector directly and indirectly affected from a lull in travel and tourism. Small businesses represent more than 96 percent of the U.S. Chamber's membership. In fact, 75 percent of these companies have fewer than 50 employees. Small businesses play a crucial part in the United States' economy, as there are roughly 22.4 million non-

farm firms in the U.S. representing more than 99 percent of all employers. Additionally, they employ 51 percent of private-sector workers, and 38 percent of workers in high-tech jobs. Small businesses account for nearly all of the self-employed, produce sixty to eighty percent of all the net new jobs and they account for 44.5 percent of total U.S. payroll. They are the fastest growing segment within this economy and women and minority entrepreneurs head many of these.

With the contributions of the small business sector to the economy, the Chamber would like to point out the dramatic impact the decline of travel and tourism in the United States has on small businesses that service and supply the travel and tourism industry. When travel slows, small businesses suffer the most because they often do not have the ability to weather a long decline in business. Small businesses such as independent hotel owners and operators, taxi cab drivers, and local restaurants are immediately impacted by a slowed travel and tourism economy. When small businesses directly impacted by the travel and tourism industry are in decline, the flow of downstream revenues to other small businesses in a community, such as dry-cleaners and local retailers, are negatively impacted as well.

The impact on communities is illustrated by the significance of small business to the communities that surround and serve our National Parks. At the Chamber's Travel and Tourism Summit, Secretary of the U.S. Department of the Interior Gale A. Norton, told the audience that in 2002, the National Park System attracted nearly 280 million visitors with 40 million of those visitors coming from foreign countries. Additionally, the Bureau of Land Management drew 54 million visitors while the National Wildlife Refuge System hosted more than 35 million visitors.

Those millions of visitors were responsible for significant economic support of the local communities surrounding those tourist destinations. A survey conducted in the mid-1990s by the Fish and Wildlife Service found that Americans spend more than $100 billion a year on wildlife-related recreation including hunting, fishing, and hiking. Such activities are supported by local small businesses that cater to those activities. Thus, when travel and tourism is slowed, so is business for numerous small businesses in local communities.

RECOMMENDATIONS

The Chamber believes that the first step to revitalizing our slowed travel and tourism industry is to restore confidence in American travel. We fully support the President's initiatives within the Department of Homeland Security to secure our nation's borders and protect our citizens. Simultaneously, we believe it imperative that our borders remain open to legitimate visitors.

Secondly, the Chamber supports an increase in the promotion of America in other countries. Currently, the United States does not do enough to promote itself as a travel destination for international visitors. As other countries are promoting their countries, the United States continues to lose market share to foreign competitors for international tourists. According to the World Tourism Organization, travel and tourism economic activity represented 11.7 percent of world GDP in 1999 with global tourism receipts reaching $463 billion in 2001. With such staggering figures, it is clear that competition for tourist dollars is on the rise and the United States must promote itself in order to compete.

The Chamber applauds President Bush, the Congress, and Senator Ted Stevens (R-AK) in particular, for the appropriation of $50 million to the United States Department of Commerce in fiscal year 2003 for a comprehensive international destination marketing campaign. These funds will allow the Secretary of Commerce, advised by the United States Travel and Tourism Promotion Advisory Board, to begin a campaign to promote the United States globally as a tourist destination.

While the appropriation to the Department of Commerce is an excellent first step in organizing a Travel and Tourism advisory board for the Administration, the U.S. Chamber also supports establishment of a separate Presidential Advisory Council on travel and tourism. The Council would be created by Executive Order as a federal advisory committee under the Federal Advisory Committee Act (FACA) and should be comprised of members from the private, public and non-profit sectors.

Over 130 countries have assigned cabinet-level tourism officials or created some form of government-sponsored tourism office. These nations have recognized the essential need for organization and promotion of their countries as travel destinations as they compete for the global tourist market. If we are to effectively compete, the creation of a Presidential Advisory Council is imperative to both cultivate policy development within the federal government as well as to measure tourism policy success.

Yet another factor that will assist the recovery of the travel and tourism industry is the strengthening of the American workforce. President Bush signed legislation

reauthorizing the work opportunity tax credit (WOTC) through December 31, 2003 and in doing so continues to help employers provide work for unskilled and disadvantaged workers. As the WOTC gives employers a federal income tax credit of up to $2,400 for each WOTC-eligible employee they hire, approximately one-fourth of the restaurants in the United States are reaping the benefit of the tax credit while providing jobs for needy employees.

Another means of encouraging travel within the United States would be passage of legislation in the 108th Congress that would fully restore the business meal and entertainment tax deduction. In the Omnibus Budget Reconciliation Act of 1993, the allowable deduction for business meals and entertainment expenses was reduced to 50 percent. The reduction of this tax deduction has negatively affected the restaurant and entertainment industries and has been particularly punitive to the small business community. Research completed in 1998 by some members of the Travel Business Roundtable showed that one-fifth of business meal users were self-employed with more than two-thirds of business meal users having incomes of less than $60,000 and 37 percent having incomes below $40,000. As such, to assist small business owners as well as boost the travel and tourism economic industry, the Chamber supports an increase in the level of deductibility of business meals and entertainment expenses.

CONCLUSION

The U.S. Chamber of Commerce remains committed to working with all sectors of the travel and tourism industry in an effort to revitalize the industry as a whole. We will continue working with the industry, Congress and the administration until we are once again the number one global travel destination.

The U.S. Chamber of Commerce would like to thank the Subcommittee for focusing attention on the economic impact of the travel and tourism industry to the United States. We appreciate the Subcommittee's review of our recommendations for re-igniting travel and tourism in the U.S. We look forward to working with the Subcommittee as it continues to examine issues related to the growth of the industry and considers policy to stimulate the revival of travel and tourism.

Mr. STEARNS. I thank the gentleman.

Before we go the chairman of the full committee, the distinguished Chairman, Mr. Tauzin, has arrived, and I would certainly welcome any comments that the Chairman has.

Chairman. TAUZIN. I thank the gentleman. I appreciate the indulgence of the committee.

I simply wanted to stop by and welcome you all and thank you for agreeing to come and testify. I particularly wanted to welcome Jim May in his new role representing a whole new industry and yet one that has just as much importance for New Orleans as does broadcasting and music and all of the good things he represented before.

I do not have to tell you how critical it is that we keep a vibrant and strong tourist economy in our country, and travel has seen some tough times since 9/11, and tourism in various parts of our country has seen, you know, its ups and downs as a result of some of the concerns we have had.

But it is still a uniquely clean, vibrant, great source of economy. I know Florida, and the Chairman has a great interest in it from a personal standing, the Florida standing with tourism, but you know, we do not take second place to anybody. Jazz Fest is going on right now in New Orleans. It is the best time in the world to be in New Orleans right now.

And I talked to my son and daughter who were there celebrating this last weekend, and the weather was beautiful and the crowds were as big as ever.

We sometimes forget how critical it is to the health of the economies that, like ours in Louisiana, is sometimes up and down with the oil and gas industry. There are times when we are really down

in the ditch, and yet tourism is as strong or stronger than ever, and it provides incredible jobs and support for families and to small businesses across my State and across the country.

And the fact that we are going to make an international push to remind people about the great places in America to see and to come and visit is something that there is a great interest in, Mr. Chairman, and I want to help you make sure that we do everything possible to build this country up to the status it once enjoyed as the No. 1 tourist landing spot in the world.

There is no reason why France ought to be ahead of us at anything right now, and this is one good example of why we ought to be leading from a position of strength again.

Thank you all for coming. Know that you are in a friendly room here. This room supports the travel industry. It supports tourism, and anything we can do to make this industry more vibrant and add to its strength and growth in the years to come we take very personal, and we will do everything we can for you.

Welcome, again, Jim, in your new assignment and new role. As I said, know that you are in good hands when you come to this committee, and we wish you well.

And, Mr. Chairman, thank you for letting me speak.

Mr. STEARNS. I thank the distinguished Chairman for his encouragement, and I appreciate his participation.

And, Mr. May, you are next with your opening statement.

STATEMENT OF JAMES C. MAY

Mr. MAY. Thank you, Mr. Chairman, and thank you to the Chairman of the full committee for his kind words.

It is a delight for me to appear before this committee in a very different capacity than I am used to. I am here representing 22 member carriers of the Air Transport Association who carry 95 percent of the Nation's passengers and cargos.

Before addressing the broader state of the industry issues, I think it is very appropriate for me to begin by thanking this committee and, in fact, the entire Congress for the refund of airline security expenses and revenues foregone in the recently passed cost-of-war supplemental appropriation.

While the question of how these costs are appropriately allocated in the future remains to be addressed, this short-term cash infusion has given this industry a very essential boost to help preserve air service and jobs.

Now, the Nation's airlines are clearly a key component of travel and tourism and the travel and tourism industry and, of course, the overall economy. The importance of civil aviation was made very readily apparent by the events of 9/11. Layoffs and financial losses in civil aviation, its supplier industries and the tourism industry and the broader economy rose sharply.

In fact, half of the jobs lost in the economy since 9/11 have been in the travel and tourism sector.

The prolonged effect of high fuel prices, escalating security and insurance costs, spiraling labor expenses, among others, have combined with a particular vengeance in an under performing economy exacerbated by the aftermath of 9/11. The war in Iraq and the outbreak of SARS have worsened that situation.

U.S. airlines lost an estimated $18 billion in 2001-2002, leaving them very vulnerable to further shocks and sustained economic weakness. To continue operations, most airlines have taken on a staggering debt load leaving them, on average, more than 90 percent leverage. Several large carriers have sought Chapter 11, as many of you in this room are well aware. Others are teetering on the edge.

In 2003, the industry is expected to record another multibillion dollar loss, despite the cost-of-war supplemental relief. Profits industry wide are not expected until at least 2005.

The pricing environment is particularly weak. The industry has experienced 20 consecutive months of double digit yield declines, and nominal domestic fares are at their lowest levels since 1987.

Now, despite these prices, traffic remains roughly 10 percent below 2000 levels. Pacific traffic, in particular, has plummeted 40 percent below last year's already depressed levels, and we know the reason why, and the trend line remains down.

Atlantic traffic is not too far behind at a negative 25 percent. Now, to cope with the smaller revenue pool now running below 1995 levels, carriers have reduced their work force by over 111,000 positions. We have parked nearly 13 percent of our overall industry fleet. Thousand more furloughs are expected. Orders for airlines are down sharply as planned retirements accelerate.

Consumer and CEO confidence indices have sunk in recent months leaving projections for summer and business travel gloomy.

Now, these traffic declines undermine the traditional relationship between passenger demand and the U.S. economy. Avoidance of air travel on this scale suggests that classical forecast models need to be recalibrated and that a robust return of even modestly growing traffic levels should not be expected within the near future.

The airline industry does not operate in isolation. Most certainly air transportation powers our national economy. It links communities together. It delivers vital, high value goods. It produces jobs across the spectrum, including our largest sector of employment, travel, and it drives just-in-time delivery, which is vital to our productivity.

There is quite literally no aspect of life in these United States that does not benefit from aviation, and unfortunately, when aviation experiences economic difficulties, those difficulties reverberate across the economy. When aviation thrives, it enhances other sectors of the economy significantly.

Now, since the advent of airline deregulation, air travelers have enjoyed a 38 percent decline in real average fares through 2000 and nearly 80 percent more service. That is as measured by departures concurrent with increase in revenue passenger miles of a couple of hundred percent. Civil aviation's total impact in the year 2000, the last full measured year amounted to about 9 percent of GDP. Directly $343 billion and 4.2 million jobs were produced in civil aviation or in industries related to civil aviation, such as travel and tourism.

Indirectly $255 billion and 3.2 million jobs are created in other industries in the civil aviation supply chain and related industries. For every job in the aviation industry, airlines industry an estimated 15 jobs are produced in the broader economy.

The airline industry recognizes its importance not only to travel and tourism, but to this national economy. It is evidenced by the tremendous growth in the industry prior to 9/11 when service was expanded and fares were cut. The industry continues to seek ways to emerge from current struggles. We have undertaken extraordinary self-help measures and are working closely with the Federal Government concerning matters of taxation, security, and funding for infrastructure enhancements.

We want passengers to again embrace air travel as the preferred mode of transportation instead of being fearful of potential dangers. Vacations should be enjoyed, not dreaded. Passengers should have several options from which to choose, and air travel should be welcomed as efficient and economical, not laborious and expensive. And most importantly, traveling by air should be safe.

The travel and tourism sector depends on the air transportation system for its economic vitality. The ATA and its member airlines are committed to meeting demands placed on our industry by virtue of its importance to the national economy and, therefore, are committed to fulfilling our role as the engine that drives travel and tourism.

In doing so, we look forward to working with both the Congress and the administration to establish policies that foster critical economic growth.

Thank you, again, Mr. Chairman, for the opportunity to appear.

[The prepared statement of James C. May follows:]

PREPARED STATEMENT OF JAMES C. MAY, PRESIDENT AND CEO, AIR TRANSPORT ASSOCIATION OF AMERICA, INC.

Mr. Chairman and members of the Subcommittee, thank you for inviting me here today to discuss the state of the travel and tourism industry. I appear before you representing the 22 member carriers[1] of the Air Transport Association, who carry 95 percent of the nation's passengers and cargo.

Before addressing the broader state of the industry issues, let me begin by thanking this Committee, and the entire Congress, for the refund of airline security expenses and revenues foregone in the recent cost of war supplemental appropriations. While the question of how these costs are appropriately allocated in the future remains to be addressed, this short-term cash infusion has given the industry an essential boost to help preserve air service and jobs.

The nation's airlines are a key component of the travel and tourism industry, and of the overall economy. The importance of civil aviation was made readily apparent by the events of 9/11. Layoffs and financial losses in civil aviation, its supplier industries, the tourism industry and the broader economy rose sharply. In fact, half of the jobs lost in the economy since 9/11 have been in the travel and tourism sector.

The prolonged effect of high fuel prices, escalating security and insurance costs and spiraling labor expenses, among other things, have combined with a particular vengeance in an underperforming economy exacerbated by the aftermath of 9/11. The war in Iraq and the outbreak of SARS have worsened the situation. U.S. airlines lost an estimated $18 billion in the 2001-2002 period, leaving them extremely vulnerable to further shocks or sustained economic weakness. We have had both.

To continue operations, most airlines have taken on a staggering debt load, leaving them on average more than 90 percent leveraged. Several large carriers have sought Chapter 11 bankruptcy protection, and another is teetering. In 2003, the in-

[1] ATA member airlines include: Airborne Express, Alaska Airlines, Aloha Airlines, America West Airlines, American Airlines, ATA Airlines (formerly American Trans Air), Atlas Air, Continental Airlines, Delta Air Lines, DHL Airways, Emery Worldwide, Evergreen International Airlines, Federal Express, Hawaiian Airlines, JetBlue Airways, Midwest Airlines, Northwest Airlines, Polar Air Cargo, Southwest Airlines, United Airlines, United Parcel Service, and US Airways. Associate members are: Aerovias de Mexico, Air Canada, Air Jamaica, KLM-Royal Dutch Airlines, and Mexicana de Aviacion.

dustry is expected to record another multi-billion dollar loss, despite the cost of war supplemental relief. Profits industry-wide are not expected until at least 2005.

The pricing environment is particularly weak. The industry has experienced 20 consecutive months of double-digit yield declines, and nominal domestic fares are at their lowest levels since 1987. Despite those prices, traffic remains roughly 10 percent below 2000 levels. Pacific traffic has plummeted to 40 percent below last year's already depressed levels—and the trend line remains down. Atlantic traffic is not too far behind at a negative 25 percent. To cope with the smaller revenue pool, now running below 1995 levels, carriers have reduced their workforce by 111,000 positions and parked 13 percent of the industry's fleet. Thousands more furloughs are expected. Orders for airplanes are down sharply as planned retirements accelerate. Consumer and CEO confidence indices have sunk in recent months, leaving projections for summer and business travel gloomy in 2003.

These traffic declines undermine the traditional relationship between passenger demand and the U.S. economy. Avoidance of air travel on this scale suggests that classical forecast models must be recalibrated and that a robust return of even modestly growing traffic levels should not be expected within the near future.

The airline industry does not operate in isolation. Most certainly, air transportation powers our national economy. It links our communities together. It delivers vital, high-value goods. It produces jobs across the spectrum—including our largest sector of employment, travel and tourism. And, it drives just-in-time delivery vital to our productivity. There is quite literally no aspect of life in the United States that does not benefit from aviation. When aviation experiences economic difficulties, those difficulties reverberate across the economy. But, when aviation thrives, it enhances other sectors of the economy significantly.

Since the advent of airline deregulation, air travelers enjoyed a 38 percent decline in real average fares through 2000 and 79 percent more service, as measured by departures, concurrent with an increase in revenue passenger miles of 200 percent. Civil aviation's total impact in 2000 amounted to about 9 percent of GDP. Directly, $343 billion and 4.2 million jobs were produced in civil aviation or in industries related to civil aviation, such as travel and tourism. Indirectly, $255 billion and 3.2 million jobs arose in the other industries in the supply chain to civil aviation and related industries. For every job in the airline industry, an estimated 15 jobs are produced in the broader economy.

The airline industry recognizes its importance not only to travel and tourism, but also to the national economy. This is evidenced by the tremendous growth in the industry prior to 9/11, when service was expanded and fares were cut. The industry continues to seek out ways to emerge from current struggles, undertaking self-help measures and working closely with the federal government concerning matters of taxation, security and funding for infrastructure enhancements. We want passengers to again embrace air travel as the preferred mode of transportation, instead of being fearful of potential dangers. Vacations should be enjoyed, not dreaded. Passengers should have several options from which to choose. Air travel should be welcomed as efficient and economical, not laborious and expensive. And, most importantly, traveling by air should be safe.

The travel and tourism sector depends on the air transportation system its for economic vitality. The Air Transport Association and its member airlines are committed to meeting the demands placed on the industry by virtue of its importance to the national economy, and therefore are committed to fulfilling our role as the engine that drives travel and tourism. In doing so, we look forward to working with both the Congress and the Administration to establish policies that foster critical economic growth.

Mr. Chairman, I again thank you for the opportunity to appear today.

Mr. STEARNS. I thank the gentleman.

Mr. Edwards.

STATEMENT OF WILLIAM H. EDWARDS, JR.

Mr. EDWARDS. Thank you, Mr. Chairman, Ranking Member Schakowsky, members of the committee.

My name is Bill Edwards. For the record, my title is the Area Vice President of the Mid-Atlantic of Hilton Hotels Corporation in Washington, DC.

I would first like to thank you, Mr. Chairman, for your opening statement. It hit every point right on the head. I think it was an outstanding summary.

As per the request, I am not going to go through a long written document. I am going to do bullet points to possibly present our position, generate questions and answers should that be necessary at the end of the day.

I am also here as the chairman of the Government Affairs Committee representing the American hotel and lodging industry.

I think what you are going to hear redundantly today is that if you look across this table as connecting the dots, where the economy goes goes the airlines. Where the airlines go, hotel guests go. Where the hotel guest goes, amusement parks go. Where our hotel guests and amusement parks go, so do restaurants.

And at the end of the day, down the road we have the unions and other employing agencies that are all tied together. So this is a set of dominos in the industry.

We are representing today more than 43,000 lodging units throughout the country. We represent over 2 million employees working in every congressional district.

The interesting point and probably the warming point I should bring across is if I take just the Hilton Washington that you have all been in, that represents 800. About 80 percent of our employees are unskilled. Thirty-eight different languages. We are usually the first front line employers for new immigrants to our country or people who need skill training.

So when we talk about layoffs and devastation in the industry, we are talking about individuals, not the MBAs from Harvard. We are talking about individuals who the day they are laid off, the next day they are hungry. They do not pay rent or bills.

So I would like to emphasize that as being critical in this discussion.

What is the state of the industry? I am going to give you bullet points. I think you have the statistics, and your staff would say all that we would say here, but so far I can tell you we have already cut 100,000, 130,000 jobs. And again, remember the people I said to focus with.

Why? Because we have fewer people traveling. Since 2000 domestic travel to us is down 9 percent; international at least 17; and those numbers are still falling.

If I take a peek at New York, I am looking at 36 percent drop since the year 2000 in daily rate. That is a 100 percent flow through to profit line, depreciation of profit line. I'm looking at occupancy of 83 percent to 69. That is individuals. We say heads in beds. That is employment; that is jobs.

If I go to the other side of the ocean, as far away as Hawaii, I can look at 30 percent drop over there, and Hilton has a major presence, and it is still dropping, obviously tied into the SARS issue.

What I would like to do for the entire committee and staff is focus on something that I think is important for a hotel, and that is measurement. Someone will say, "Oh, occupancy is up." Well, that may be the case, but that is not a measuring device of success in hotels.

If they look at our portfolio, we own Hampton Inns, Doubletrees, Embassy Suites, Hilton Hotels, whatever. We own Bally's, Caesars, all of this stuff. The measuring device is RevPAR, revenue per available room, and you have to look at that in its total picture. If I sell a room for $10, I will have 100 percent occupancy, especially in Washington. I will not make any money.

You want to look at the total package of revenue per available room, which is what your hotel corporations look at, which is what your developers look at.

So if we talk RevPAR, everyone says that while leisure destinations are up or suburban State or rural States are up in occupancy, well, fine, but they are also heavily discounting to obtain that occupancy.

I think we have to be very cautious about discounting, which does not necessarily produce RevPAR, which definitely does not produce profits. So I think the occupancy argument in any discussions in this committee should be guarded, and the question should be asked: what about RevPAR, revenue per available room?

If we look at profits, if we take it back to the year 2000, we are down easily a third. The average in the industry this year, for example, is we dropped 19.4 percent in 2001 and another 9.6 percent in 2002. And as you very eloquently stated in your opening comments, 2003 is not exactly headed in the right direction.

This is the first time in 2001 and 2002, by the way, that this industry has showed consecutive year depreciation of business since 1982 or 1983. One of the spinoffs of this situation is the delinquency rate in hotels and the lack of development of jobs in many of our inner cities.

For example, I had the privilege of growing up in the great city of Chicago. My home as a child was the 17th floor of the Farmer House. This is a plug.

But growing up there, I understand that Chicago, in fact, is the convention capital of the United States. We can argue that between New York and Washington and other cities, but let's face it. That is where the life blood is. That industry goes down; that city goes down.

So when we start talking about hotel development, you can take Washington, DC. We have a brand new Convention Center. Guess what. We do not have a hotel down because they cannot get finance. What is going to happen to this new Convention Center? It is going to be a longer haul.

So what happens when profits go down? What do managers of units usually do? Well, they start closing restaurants. They start cutting staff. They start looking at marketing efforts at secondary or discounted markets, which depresses RevPAR further.

I can tell you right now my brother works for a major competing firm I will not mention here. They are on a 4-day work week for executives. I just announced for the Mid-Atlantic, which covers from Pittsburgh down, that they are going to forced vacation starting in May. These are the executive branch.

Do not think for a minute that we are putting on the shoulders of all of our team members these layoffs. It is going right from the management on down.

But profits are not just down on rooms division. You know, you have banquets in the big hotels, be it Chicago, the Chicago Hilton, the Palmer House, in Washington this one, the Marriott Wardman, all of these big banquets. I got a call 4 days in advance of the radio and television correspondents that they had to cancel it as a result of the war. Four days for a dinner of 2,800 people that is worth over $200,000. That is 210 waiters, 80 chefs, again, not working that night.

So this is the kind of action/reaction we have.

The other element that is of concern is the cities and States and local governments want to increase taxes for their own benefit. That is a dangerous task. So we want two things. We want to endorse your efforts with the $50 million. We also want to work together as a team to open doors, to bring people to this country, and help Americans travel easier.

[The prepared statement of William H. Edwards, Jr. follows:]

PREPARED STATEMENT OF WILLIAM H. EDWARDS, JR. CHAIRMAN, GOVERNMENTAL AFFAIRS COMMITTEE, AMERICAN HOTEL & LODGING ASSOCIATION AND AREA VICE PRESIDENT, HILTON HOTELS CORPORATION AND GENERAL MANAGER, HILTON WASHINGTON

INTRODUCTION

Mr. Chairman, Ranking Member Schakowsky, members of the Subcommittee, thank you for the opportunity to testify on travel and tourism in America today, particularly on the state of the U.S. lodging industry. In many ways, these are the most difficult and unpredictable times we have seen in more than a generation so this hearing and this opportunity to testify is critically important.

I am here in my capacity as Chairman of the Governmental Affairs Committee of the American Hotel & Lodging Association (AH&LA). AH&LA represents the nation's $100 billion lodging industry. Nationwide, there are more than 43,000 lodging properties. These properties represent roughly 2,000,000 employees and voters in every Congressional District.

Now, let me tell you a bit about my background. I have been a hotel general manager for 25 years, in the industry for over 30 years, and in my present position as Vice President with Hilton Hotels for eight years. In addition to my long involvement with AH&LA, I am a past President and Chairman of the Hotel Association of Washington, D.C. and the Washington Convention & Visitors Association as well as similar positions in San Diego.

STATE OF THE LODGING INDUSTRY

As I mentioned earlier, the lodging industry is facing very challenging times. The poor economy, traveler fears, post-9/11 security measures, SARS, and other factors have played a part. Here are some basic statistics to support my characterization:

We have had to cut approximately 130,000 jobs since mid-2001. This figure masks the efforts made by many hoteliers to retain employees by shifting some to part-time work until business improves.

Fewer people are staying at our hotels. As has been noted, since 2000, domestic business travel is down almost 9% and international arrivals are down 17%, so it is not surprising that some properties have fared differently than others. In general, drive-to destinations have done better than fly-to destinations, and leisure destinations, better than business destinations. For example:

- The average room rate in NYC has fallen 36% from 2000, while occupancy has dropped from 83% to 69%.
- Visitors to Hawaii are down 30% from last year.

For the year 2002, occupancy, average room rate, and Revenue Per Available Room or RevPAR were all down from 2001, and we experienced more of the same trend during the first quarter of this year: occupancy, average room rate, and RevPAR all were down.

I should note that RevPAR is a better gauge of the health of the industry than occupancy rates, which seem to get more play in the media. I could get to 100% occupancy quite quickly if I charged $10 a night. I also would lose my job. RevPAR

factors in the rate at which I'm selling my rooms, which gives you and the hotel's owner a much better idea if the property is profitable or not.

One of the main reasons leisure destinations are doing as well in occupancy is that hotels and airlines have been cutting prices. That has helped boost occupancy, but has not helped RevPAR. So please don't assume that all is well when you hear that "occupancy is up" in a certain city or hotel.

Speaking of profits, overall, the industry is profitable, but those profits have fallen considerably and not all hotels are profitable. Industry profits are down one third since 2000 and are projected to fall again this year.

At the individual property level, the operating profit of the average US hotel dropped 9.6% in 2002 after dropping 19.4% in 2001. This is the first time profits have dropped in two consecutive years since 1982-83.

What profitability our industry is enjoying is not being enjoyed by all. Hotel loan delinquencies are at their highest since the early 1990s. Perhaps this explains why the number of hotel development projects that started construction in the first quarter of 2003 was the lowest quarterly total since the early 1990s, following Operation Desert Storm.

To stay in the black, the industry has taken some extraordinary measures, for example: closing restaurants, cutting staff, shifting marketing efforts, and getting control of the Internet market, which has driven down rates to alarming levels. In their cutbacks, hotel operators have tried mightily to focus on areas that the guest will not notice and to a large degree we have succeeded. But there is little left to cut that would not affect guest service.

It is not just the room rate. Hotels derive income from much more than the rate charged for a night's sleep. There are restaurants and shops in the lobby, in-room movies and mini-bar, and resort activities to name a few. When the number of guests declines, the number of customers for these activities declines as well.

Further, many hotels do considerable banquet business as part of conventions or as a stand-alone event. This business too has dropped. In some instances, this is due to the weak economy, but in others there is a direct correlation to changes in the Department of Homeland Security Advisory System's terror threat level. Obviously, we feel this acutely here in Washington.

In addition to these issues, we are beginning to face another challenge: cash strapped *state and local governments* are looking for ways to raise money and some of them are looking at the travel industry.

Some governments are seeking to raise their occupancy taxes. Anyone who travels can tell you that hotels are not undertaxed. Others are cutting their state tourism promotion budgets, a self-defeating act if ever there was one. Still others are getting more creative in taxing such items as phone service, parking, and mixed drinks.

RECOMMENDATIONS

Rather than give you a long list of measures that the industry would like to see enacted, let me focus on two recommendations.

America needs a sustained international marketing campaign supported by the federal government.

As I noted earlier, international arrivals are down 17% since 2000. The international economy is partly to blame, but we also must acknowledge that steps taken since 9/11 to make America more secure have given many potential foreign visitors the impression that America is not a welcoming destination.

Keeping out those who wish us harm is critical to the health of the travel industry. No sector was hurt more by the terrorist attacks and none would be damaged as much by a second strike. But it is imperative that we also work hard to facilitate the flow of legitimate travelers to the US. A sustained US marketing initiative can help.

As we all know, Congress has appropriated $50 million for such an effort. First of all, thank you.

Secondly, we at AH&LA pledge to do what we can to ensure that this money is well spent: that it will demonstrate that marketing can significantly increase the number of visitors to the US, generating more jobs for American workers, more income for domestic businesses, and more tax revenue for all levels of our government. We are working closely with the Department of Commerce to achieve these goals. As a team—the hotel industry, the Department of Commerce, and the Congress can turn this around.

Grow the Economy

No single factor has a greater impact on the health of the lodging industry than the current state of the economy. When times are tough, companies tighten up their travel policies: limiting attendees at a meeting, cutting per diems, or banning travel

entirely. Some industry analysts are predicting that the combination of 9/11 and the recession have permanently changed business travel, with more and more companies turning to videoconferencing and other alternatives.

The health of the economy also has significant impact on leisure travel. People worried about their jobs cut back on their vacation, that is if they take vacations at all.

AH&LA supports a tax cut package big enough to grow the economy, create jobs, and therefore stimulate travel. The President has a broad plan that AH&LA supports, but it is clear that both the House and Senate have ideas of their own. We are less concerned about the specifics of the bill than about its impact. We have expressed this viewpoint consistently and lobbied for it during our recent legislative conference. We urge Congress to approve a substantial measure that will achieve significant economic growth.

CONCLUSION

Again, Chairman Stearns, Representative Schakowsky, thank you for this opportunity to testify at the important hearing. I would be happy to answer any questions you may have.

Mr. STEARNS. I thank the gentleman.

Mr. Robinson.

STATEMENT OF J. CLARK ROBINSON

Mr. ROBINSON. Thank you, Mr. Chairman, Ms. Schakowsky, and other members of the committee.

Mr. STEARNS. Just pull it a little closer maybe if it reaches there. Good. Thanks.

Mr. ROBINSON. There we go.

In behalf of the members of the International Association of Amusement Parks and Attractions, also known as IAAPA, I would like to thank you for this opportunity to testify today.

Also, if I may, Mr. Chairman, I would like to submit the full written testimony to the committee.

Mr. STEARNS. By unanimous consent, so ordered.

Mr. ROBINSON. Thank you.

IAAPA is the largest international trade association for amusement parks worldwide. In fact, we represent more than 5,000 amusement and theme parks, attractions, and suppliers from over 85 countries.

Now, let me turn to the state of the industry. Overall the U.S. travel and tourism industry has been adversely affected by the reduction of visitors from overseas. The U.S. share of international travel has declined 30 percent over the last 10 years while worldwide outward tourism has increased by 50 percent.

Additionally, the travel and tourism industry accounts for 6 percent of all U.S. employment. However, 30 percent of all post 9/11 job losses were in the travel and tourism industry.

From September 2001 through December 2002, 387,000 jobs have been lost. The tragic events of September 11, have had an immediate and continuing impact on destination parks that were still open in the fall of 2001. The post 9/11 drop in international visitors led to an overall attendance decrease of 6 to 8 percent in the Orlando theme park market during 2002.

Total international arrivals in the U.S. declined 7 percent in 2002. Overseas guests are among the most valuable customers for destination facilities. Visitors spend more, stay longer, and return often. The average overseas visitor to Orlando stays 10 nights compared to 5 for domestic visitors.

In Los Angeles, the average overseas visitor stays 6 and 7 nights versus the average domestic visitor's stay of less than 4 nights.

While the impact of a decrease in overseas visitors is felt to varying degrees in other types of parks and attractions, attendance in regional parks in 2002 was mixed, and attendance at local parks has generally increased.

At year's end, America's amusement parks and attractions played host to over 300 million visitors and generated revenues of more than $9 billion. Attendance growth in the industry has averaged 2 to 3 percent annually for the past 2 decades, while revenues have increase 5 to 6 percent annually on average during the same period.

In terms of wider economic impact, studies have determined that for every $1 spent inside a park or attraction, another $2 to $4 are spent outside its gates. Thus, last year $18 to $36 billion was spent in related communities across the United States.

IAAPA joins other segments of the travel and tourism industry in gratitude to Congress for appropriating $50 million for United States Travel and Tourism Promotion Advisory Board. We believe this appropriation should be used for a comprehensive international destination marketing campaign to bring overseas travelers back to the United States. The funds should not be broken up and used in several projects, but rather applied to a measurable, unified campaign.

And to move even further in promoting tourism, a Presidential advisory council should be considered to provide additional guidance to the Federal Government on tourism issues.

IAAPA and its members of the travel and tourism industry support the need for secure U.S. borders. At the same time, we urge you that all steps be taken to ease the entry into this country for visitors who wish to experience the United States. IAAPA members, along with many other segments of the travel and tourism industry make extensive use of the J-1 visa program, as well as other visa programs. While international students provide a valuable work force, they also return home with a better understanding of the values and cultures of America.

IAAPA joins others in the travel industry in encouraging the Department of Homeland Security to partner with industry to find ways to protect our borders against those who would do us harm, while not making access to the U.S. overly difficult for those who want to visit.

Efforts to market the U.S. internationally will be for naught if we make it too difficult for visitors to enter our country.

In conclusion, we believe our success is our own, but we ask the government to support us by helping promote our Nation as the wonderful destination that it is.

Thank you for this opportunity share our concerns, and I would welcome any questions.

[The prepared statement of J. Clark Robinson follows:]

PREPARED STATEMENT OF J. CLARK ROBINSON, PRESIDENT, INTERNATIONAL ASSOCIATION OF AMUSEMENT PARKS AND ATTRACTIONS

Mr. Chairman, Ranking Member Schakowsky, and Members of the Subcommittee, on behalf of the members of the International Association of Amusement Parks and

Attractions, also known as IAAPA, I want to thank you for the opportunity to testify on the current state of our industry.

Let me begin with a brief description of IAAPA. IAAPA is the largest international trade association for permanently situated amusement facilities worldwide. In fact, we represent over 5,000 amusement and theme parks, attractions, and suppliers from over 85 countries. While 40% of our amusement facility members are amusement and theme parks, the rest is a mix of family entertainment centers (35%), waterparks (7%), zoos and aquariums (5%), and other attractions (13%).

The IAAPA annual convention and trade show is the largest event in the amusement industry. More than 30,000 attendees experience all elements of the amusement and attractions industry. International exhibitors make up approximately 20% of the show, and 19% of the attendees are international. International visitors come from as far away as Dubai and Korea, or from as close as Mexico and Canada. In 2002, exhibitors came from China, Saudi Arabia, Australia, Italy, Scotland, and many other countries.

IAAPA's goal is to help our members improve their safety, efficiency, marketing, and profitability while at the same time, maintaining the highest possible professional standards in the industry.

2002 SEASON

Now, let me turn to the state of the industry today.

Travel and Tourism Industry: Overall, the U.S. travel and tourism industry has been adversely affected by the reduction in visitors from overseas. The U.S. share of international travel has declined by 30% over the last ten years, while worldwide outbound tourism has increased by 50%. According to the Travel Industry Association of America, the travel and tourism industry accounts for 6% of total US employment. However, 30% of all post-9/11 job losses were in the travel and tourism industry. The travel and tourism industry has lost 387,000 jobs from September 2001 through December 2002.

Amusement Parks and Attractions: Amusement parks and attractions, national landmarks, historic sites, and many other tourist destinations in our country are major drivers in the travel and tourism industry. They provide incentives for families and travel groups, both domestic and international, to board airplanes, cruise lines or trains, or jump into their cars and stay in hotels. When attendance at our facilities and the other wonderful tourist destinations around the country begins to decline, a ripple effect is felt throughout the economy.

The tragic events of September 11, 2001, had an immediate and lasting impact on our destination parks that were open in the fall of 2001. Destination parks are typically facilities where a sizeable portion of business is derived from guests who travel considerable distances specifically to visit the park and stay for several days, enjoying a facility's additional offerings, such as a second park or waterpark, hotels, restaurants, or shopping in the region. Destination parks include numerous facilities within the Disney, Universal, and Anheuser-Busch park companies. The post-9/11 drop in foreign visitors led to an overall attendance decrease of 6-8 percent in the Orlando theme park market during 2002. Total international arrivals in the U.S. declined 7 percent to 41.9 million in 2002 compared to 2001, according to figures just released by the Department of Commerce, Office of Travel and Tourism Industries.

Overseas guests are among the most valuable customers for these facilities. They spend more, stay the longest, and come back often. The average overseas visitor to Orlando stays ten nights, compared to five for domestic visitors. In Los Angeles, the average overseas visitor stays between six and seven nights versus the average domestic visitor's stay of less than four nights. 72% of overseas visitors to Orlando and 66% of overseas visitors to Los Angeles are repeat visitors. Events of the past 19 months have had the biggest impact on these overseas visitors and have increased the awareness of the 10-year trend in market share decline in overseas visitors to the U.S.

While the impact of a decrease in overseas visitors is felt to varying degrees in other types of parks and attractions, attendance at regional parks in 2002 was mixed and attendance at local parks was generally increased. Regional parks are those whose guests are drawn from within a 150-200 mile radius of the park, and local parks draw their guests mostly from a particular community and its immediate surroundings. In some cases, attendance declines have been offset by an increase in average customer spending. At year's end, despite the decline in overseas visitors, America's amusement parks and attractions hosted over 300 million visitors and generated revenues of more than $9 billion.

Summary: Attendance growth in the U.S. amusement parks and attractions industry overall has averaged 2-3% annually for the past two decades, while revenues have increased 5-6% annually on average during the same period. We want to continue or increase this growth trend with the accompanying benefits that will result for local economies in which facilities are located.

The size of this growing industry makes its economic health of interest to more than just the owners and operators of these parks and attractions. Recent industry analyses have forecast that, without unusual events such as the terrorist attacks of September 11, steady attendance and revenue growth will continue at U.S. parks and attractions over the next five years.

In terms of wider economic impact, studies have determined that for every $1 spent inside a park or attraction, another $2-4 is spent outside its gates. Thus last year, at least $18 to $36 billion were spent in communities of which these facilities are members. In addition, the U.S. amusement industry employs upwards of half a million people, including the manufacturer base and seasonal park employment. A lower growth rate in the industry will have a seriously negative impact on the many local economies around the country that include an amusement park or attraction.

GOVERNMENT EFFORTS THAT WOULD AID THE TRAVEL AND TOURISM INDUSTRY

As I have already noted, the U.S. travel and tourism industry has not yet recovered from the impact of the September 11 tragedy. The lingering effects of the economic downturn and the war have exacerbated an already difficult situation. Government assistance similar to that provided to travel and tourism by other governments around the world can play an important part in the industry's recovery.

United States Travel and Tourism Promotion

IAAPA joins other segments of the travel and tourism industry in gratitude to Congress for appropriating $50 million to promote the United States as a destination for foreign travelers. The United States Travel and Tourism Promotion Advisory Board will advise the Department of Commerce on these efforts. As I have already noted, visitors from overseas constitute an important portion of the guests at destination parks. These visitors travel to other parts of the country, as well, visiting other attractions. These are difficult times for the U.S. travel and tourism industry, and it is heartening to see the federal government step in and allocate these funds to assist the industry.

We believe this appropriation should be used for a comprehensive international destination marketing campaign to bring overseas travelers back to the United States. We feel it is important that the use of these funds is timely, targeted, and focused on a limited number of foreign markets where the return is likely to be the greatest. The campaign should utilize and promote a national brand.

The funds should not be broken up into several small projects, but rather applied to a unified campaign whose results are measurable. Demonstrated success can show the need, which we believe exists, for a long-term authorization of the program, along with an appropriate level of funding. IAAPA and its members look forward to working with the Department of Commerce as this important project gets underway.

Presidential Advisory Council on Travel and Tourism

To move even further in promoting tourism, an advisory council should be established to provide guidance to the federal government on tourism issues. Much has been accomplished by the Commerce Department's reactivation of the inter-agency Tourism Policy Council. While we are also delighted that the Department of Commerce is in the process of forming a Travel and Tourism Promotion Advisory Board, we believe that a need remains for the establishment of an advisory council composed of members of the private, public, and non-profit sectors. Such a council would be able to assist with development and coordination of tourism policy, as well as developing appropriate benchmarks to measure tourism policy success. The amusement industry is a driving force in tourism, as it bridges various sectors of the broader travel and tourism industry and therefore would be a strong asset on such a panel.

Visa and Immigration Issues

IAAPA and all members of the travel and tourism industry support the need for secure U.S. borders. At the same time, we would urge that all steps possible be taken to continue to facilitate entry into our country for legitimate visitors who want to come enjoy all that the U.S. has to offer. Striking the right balance is difficult, yet essential.

IAAPA's members, along with many other segments of the travel and tourism industry, make extensive use of the J-1 summer travel/work visa program, as well as other visa programs.

International students come to experience our culture, improve English skills, learn job skills and earn wages. Parks and attractions play a prominent role in this program and, in turn, these students provide a valuable workforce—especially in August, when many of our American summer employees return to school. Even more important, the students who participate in this program learn the true nature of the United States. They are then able to explain to others in their own countries the values and culture of America. Firsthand knowledge goes far toward overcoming misperceptions. Changes to the State Department summer work/travel regulations that would limit the number of students coming into the country or eliminate the students' ability to build on their learning experience by participating more than once would be detrimental to the industry and to our country.

We believe the government should focus on unwanted visitors rather than casting too wide of a net that would adversely affect the many businesses that rely on international visitors and student workers without noticeably increasing our nation's security. We have similar concerns regarding any possible changes to visitor visas.

IAAPA joins others in the travel industry in encouraging the Department of Homeland Security to partner with the industry to find ways to protect our borders against those who would do us harm, while not making access to the U.S. excessively difficult for those who legitimately want to visit our country. We are finding that in Europe and elsewhere, the perception exists that it is already more difficult to enter the U.S. Efforts to market the U.S. internationally will be for naught if we make it too difficult for visitors to enter our country, or even if the perception spreads that such difficulty exists.

CONCLUSION

We believe our success is in our own hands, but we ask that the government support us by helping promote our nation as the wonderful destination it is, and by not imposing regulatory constraints that will deter us from maximizing our potential. This unwavering commitment to our businesses, our communities, and our country has allowed the amusement parks and themed attractions industry to thrive for more than a century, and will ensure that it continues to provide safe and fun family entertainment for many years to come.

I thank you for the opportunity to share my remarks with you and would welcome any questions.

Mr. STEARNS. Well, thank you.

Mr. Sternberg.

STATEMENT OF MICHAEL STERNBERG

Mr. STERNBERG. Thank you, Mr. Chairman and Ranking Member Schakowsky and members of the committee.

My name is Michael Sternberg, and I am the founder and CEO of Sam & Harry's, Sam & Harry's Tysons Corner, the Caucus Room, and the soon to open Harry's Taproom in Arlington, Virginia.

I'm testifying here today on behalf of the National Restaurant Association, which is the leading business association for the restaurant industry, and, Ms. Schakowsky, I am also proud to say that I am a native Chicagoan, born in Edgewater Hospital and learned my trade at the feet of—oh, really?—and learned my trade at the feet of Arnie Morton, who was a master at understanding the importance of travel and tourism.

Together with the National Restaurant Association Educational Foundation, the National Restaurant Association's mission is to represent, educate, and promote a rapidly growing industry that is comprised of 870,000 restaurant and food service outlets, employing 11.7 million people around the country.

Consumers spend nearly $1.2 billion a day in the Nation's restaurants. Every $1 spent in the restaurants creates an additional $2.13 in sales for other industries throughout the economy.

As a member of the board of directors of the association, I am proud to say that our Nation's restaurant industry is the cornerstone of the economy, careers and community involvement. Restaurants are vital components to the travel and tourism industry. That is why I am so pleased to be here today participating in this important discussion.

It will probably not be a surprise to many of you in the room to hear that restaurateurs depend heavily on the tourism business, nor will it be a surprise to learn that more than two thirds of table service restaurants view tourists as an important component of their business, and here is why.

About 40 percent of revenues as table service restaurants with higher check averages come from tourists. Spending by travelers accounts for roughly 15 to 30 percent of revenue at table service restaurants with average check sizes of less than $25.

These figures give you some idea of the symbiotic relationship between restaurants and tourists. They also demonstrate why the events of September 11 and the continued threat of terrorism have been such a devastating blow to the restaurant industry, as they do for so many of the groups represented in this room.

The economic repercussions of September 11 were great. As people holed up, glued to the television, the travel and tourism industry virtually came to a halt. In September 2001, 38,000 restaurant jobs were eliminated. The following month, October, the number rose to 57,000 jobs. As of March 2003, restaurant employment is down 244,000 jobs since 2001.

The hardest hit restaurant sector was fine dining establishments and tourist dependent restaurants, especially those in the Northeast.

The top 100 travel destinations experienced the greatest total lost of tourism revenue, approximately $30 billion, and 4 out of the 5 top spots are all located in the northeast.

In 2002, my restaurant spent almost $120,000 in additional marketing funds just to maintain the same sales level that we saw in 2001. Most restaurants do not have the luxury of spending that type of money on marketing.

But it also proves that marketing dollars do help and work.

The National Restaurant Association worked hard to help an industry persevere through this difficult time. Through a major multimillion dollar public relations campaign we encouraged people to turn the tables and reminded them how vital the Nation's restaurants were to economic security. Innovative and entrepreneurial restaurants sought new ways to drive business and remind customers of how dining out could invigorate spirits and the economy.

As a result, individuals and businesses continue to cut back on discretionary spending, including dining out and other travel related activities. In addition to sending a tremendous shock to our economy, the continued threats of terrorist acts and the conflict overseas also caused the Nation to focus on relatively new entity, homeland security.

We would like to outline a few suggestions today that the restaurant industry thinks will both help restore travel both inside and to the United States. The National Restaurant Association urges Congress to increase the business meal and entertainment tax deduction and restore the spousal travel tax deduction. Now more than ever, this would provide an incentive for small businesses and corporations to authorize their employees to start traveling again.

We also request Congress' support in urging the President to create the Presidential Advisory Council on Travel and Tourism. The council would advise the President on national tourism policies and would help insure that travel and tourism receives a more sustained and vigorous policy focus at the Federal level.

And, finally, the National Restaurant Association applauds Congress and Senator Ted Stevens, in particular, and the President for appropriating $50 million to the Department of Commerce in fiscal year 2003 for the creation of a comprehensive United States destination marketing campaign. While these funds are an extremely important first step in promoting the United States as an attractive travel destination, it is our hope that Congress will consider a longer term authorization to capture these travelers that our economy desperately needs.

Mr. Chairman and members of the committee, I thank you for this opportunity to be before you, and I thank you for your interest in the travel and tourism industry. I welcome any questions you might have.

[The prepared statement of Michael Sternberg follows:]

PREPARED STATEMENT OF MICHAEL STERNBERG, CHIEF EXECUTIVE OFFICER, SAM & HARRY'S, THE CAUCUS ROOM, WASHINGTON, DC, ON BEHALF OF THE NATIONAL RESTAURANT ASSOCIATION

Thank you, Mr. Chairman. Chairman Stearns and members of the Committee, my name is Michael Sternberg, and I am the CEO and co-owner of three fine-dining restaurants in metropolitan Washington , Sam & Harry's, Washington D.C. , Sam & Harry's, Tysons Corner and The Caucus Room. I am testifying here today on behalf of the National Restaurant Association, which is the leading business association for the restaurant industry. Together with the National Restaurant Association Educational Foundation, the Association's mission is to represent, educate, and promote a rapidly growing industry that is comprised of 870,000 restaurant and foodservice outlets employing 11.7 million people around the country. Consumers spend nearly $1.2 billion a day in the nation's restaurants. Every one dollar spent in a restaurant creates an additional $2.13 in sales for other industries throughout the economy. As a member of the Board of Directors of the Association, I am proud to say that our nation's restaurant industry is the cornerstone of the economy, careers and community involvement.

Restaurants are a vital component of the travel and tourism industry. That is why I am so pleased to be here participating in this important discussion today. It will probably not be a surprise for many of you in the room to hear that restaurateurs depend heavily on tourism business. Nor will it be a surprise to learn that more than two-thirds of tableservice restaurants view tourists as an important component to their business. And here's why: About 40 percent of revenues at tableservice restaurants with higher check averages come from tourists. Spending by travelers accounts for roughly 15 to 30 percent of revenue at tableservice restaurants with average check sizes of less than $25. These figures give you some idea of the symbiotic relationship between restaurants and tourists. They also demonstrate why the events of September 11, and the current state of affairs have such a devastating blow to the restaurant industry—as they do for so many of the groups represented in this room.

The economic repercussions of September 11 were great. As people holed up, glued to the television, the travel and tourism industry virtually came to a halt. In

September 2001, 38,000 restaurant jobs were eliminated. The following month, October 2001, that number rose to 57,000 jobs. As of March 2003, restaurant employment is down 244,000 jobs since 2001. The hardest hit restaurant sector was fine dining establishments and tourist dependent restaurants, especially those in the Northeast. The top 100 travel destinations experienced the greatest total loss of tourism revenue—4 out of the top 5 spots are all located in the Northeast. The National Restaurant Association worked hard to help the industry persevere through this difficult time. Through a major multi-million dollar public relations campaign, we encouraged people to "turn the tables" and reminded them how vital the nation's restaurants were to economic security. Innovative and entrepreneurial restaurateurs sought new ways to drive business and remind consumers of how dining out could invigorate spirits and the economy. The restaurant industry is incredibly resilient and with the help of our Cornerstone Initiative Public Relations Campaign, the ingenuity of the restaurant industry and the American people, the industry rebounded.

Today, this very same industry faces yet another wave of challenges. The uncertainty of the nation's economy, the war in Iraq, heightened concerns about possible terrorist threats on U.S. soil, and international health threats, all have slowed or reversed any recovery that was occurring in the travel and tourism industry. As a result, individuals and businesses continue to cut back on discretionary spending, including dining out and other travel-related activities. In addition to sending a tremendous shock to our economy, the events of September 11, and the conflict overseas also caused the nation to focus on a relatively new entity: homeland security. The nation's restaurants have long been committed to food safety, and have been leading efforts to ensure that employees are trained and certified in safe food handling practices. Since September 11, the nation's restaurants have been operating with a heightened sense of awareness and vigilance on food security issues. We are working closely with the Administration on this important issue—particularly as they implement the regulations on the recently passed bioterrorism legislation. From ensuring that food inside our borders is secure, we are also working to ensure that imported items that consumers have come to know, love, and expect on their favorite menu—remain on the menu.

These changes will go a long way in helping to restore confidence among the American people, and will be tremendously helpful in encouraging normalcy and invigorating travel in this country. Other opportunities that will help restore travel both inside and to the United States are equally important: The National Restaurant Association urges Congress to increase the business meal and entertainment tax deduction and restore the spousal travel tax deduction. Now more than ever, this would provide an immediate incentive for small businesses and corporations to authorize their personnel to start traveling again. The reduction of the business meal and entertainment tax deduction from 100 percent to 50 percent and the elimination of the spousal travel tax deduction negatively affected the restaurant and entertainment industries and the business customers they serve even before September 11, particularly harming small businesses. We also request Congress' support in urging the President to create the Presidential Advisory Council on Travel and Tourism. The Council would advise the President on national tourism policies and would help ensure that travel and tourism receives a more sustained and vigorous policy focus at the federal level. It would also help coordinate the activities of the Administration and the many departments and agencies that impact travel and tourism. And finally, The National Restaurant Association applauds Congress, Senator Ted Stevens in particular, and the President for appropriating $50 million to the Department of Commerce in fiscal year 2003 for the creation of a comprehensive United States destination marketing campaign. With the continuing decline in international arrivals, the balance of trade surplus generated by travel and tourism has plummeted from $26 billion in 1996 to $8.6 billion in 2001. While these funds are an important first step in promoting the United States as an attractive destination, the National Restaurant Association hopes that Congress will consider a longer term authorization to capture these travelers that our economy desperately needs.

Mr. Chairman and members of the Committee, I thank you for this opportunity to appear before you today, and I thank you for your interest in the travel and tourism industry.

Mr. STEARNS. I thank the gentleman.

Mr. Ruden.

STATEMENT OF PAUL M. RUDEN

Mr. RUDEN. Thank you very much, Mr. Chairman.

I am not going to consume the committee's time repeating the horror stories that others have told, except to say that the travel agent industry, as most of you probably know, is mostly small business, down to the tiniest businesses of just one or two people. Even the big brand names that people are accustomed to hearing about are usually manifested in the marketplace through very small enterprises that are independently owned.

Suffice it to say in statistics, the air component alone of what travel agencies sell, and they still sell most of the air that is sold in this country, between the year 2000 and the year 2002, sales declined $20 billion. That is just one segment of what they sell.

If you want further dimensions of the horror story, I would refer the committee to the National Commission to Insure Consumer Information and Choice in the Airline Industry report, which issued last November, which summarizes the impact of the economy and airline practices and other factors that have devastated many, many small businesses in the travel agency sector of the economy.

It is also true and needs to be understood that every horror story you hear from the airlines about how much money they are losing and the hotels and all of the stories they tell are correct. Most of that damage, that loss also flows down to travel agencies who are responsible for selling most of the business that goes into those airplane seats and much of the business that goes into those hotel rooms and even down to the restaurant level.

The public has been devastated by the four things you heard about: the economy, SARS, the war, terrorism. And the effects continue. People are buying later, making it very difficult for anyone in our industry to plan anything because consumers are holding back their commitments to the very last minute in many, many cases, and they're traveling a lot closer to home than they used to and spending less.

The uncertainty and fear run throughout the economy and run very deeply. When it is all said and done, there is not going to be any bailouts for our part of the industry. We are doing everything we can, however, independently to stimulate travel, and I think that ultimately, while we share all of these recommendations in common with everyone in this panel, and I have got another one to talk about in a minute; all of those things are good things to do, but at the end of the day we have to conquer SARS. We have to get confidence back that way in order for people not to be afraid.

We have done advertising programs. We put together a public service announcement with Jim Lovell, the commander of Apollo 13, who if anyone knows about trouble traveling, he does, and that public service announcement was seen by over 100 million people so far, and the radio exposure is probably another 100-plus million people.

We have got an ad campaign in USA Today every Friday afternoon featuring cruises and tours, encouraging people to travel, running contests.

There is a real interesting story of a travel agency just up the road outside Philadelphia that is holding a museum like exposition of travel photographs in its agency and inviting the public in to come in and see these local photographers, who are not national brand names, but who take pretty good pictures. They are having

contests. Suppliers will be present to talk to the people who are interested and so forth. Everybody is doing everything they can at a local level, which is where all of these travel agencies are best known, to try to stimulate interest in travel.

We are working with Sandals Resorts. Once again, that company has come forward with a $2 million program of free travel opportunities to their resorts for people, men and women in the Service.

All of these things are being done around the country. We will continue to do them as long as the resources exist to do it.

Our view, I think, is that the thing that is hurting us that is an example of how we hurt ourselves, is that our government sometimes takes actions in the name of security which always has to be first, I suppose, without apparent regard for the impact on the travel and tourism sector, and the alerts that have no apparent reason, none that is given anyway, have frightened people away from traveling. You can see it in what happens in the immediate aftermath of these announcements, and then the alerts are taken down with no apparently explanation of why things have changed.

I am not suggesting the government has to reveal its security information. What we are suggesting is that the Department of Homeland Security should have an office that acts as a filter, at least an opportunity to comment on the impact on the travel and tourism business of new regulations and new pronouncements that the department is considering making before those things are made so that if a decision is made that we have to harm tourism again, at least it is made knowingly and not inadvertently.

With that I thank the committee for the opportunity to speak today and ask that my full statement, which has a great deal more information in it, be admitted to the record.

Thank you.

[The prepared statement of Paul M. Ruden follows:]

PREPARED STATEMENT OF PAUL M. RUDEN, SENIOR VICE PRESIDENTL LEGAL & INDUSTRY AFFAIRS, AMERICAN SOCIETY OF TRAVEL AGENTS, INC.

The American Society of Travel Agents ("ASTA") offers this testimony on the Subcommittee's deliberations on the state of travel and tourism in the United States. We will offer some background and some thoughts about what travel agencies can and are doing to stimulate travel in the near term future. ASTA much appreciates the opportunity to present its views, and remains at the Subcommittee's disposal to assist in any way it can on these subjects that are so vital to the national economy.

It is a fair statement, and no surprise in light of the ubiquitous news reports, that the condition of the travel industry overall is dismal. Prior to the SARS outbreak, there were some bright spots, and one or two may yet remain, but in general, for most industry participants, and in most sectors, the picture is bleak.

There are four factors involved: (1) the economy is unhealthy, resulting in impaired consumer confidence and a reduced willingness to spend money on leisure and many business travel pursuits; (2) the terrorist attacks of September 11, 2001, and the government's response to them have left long-lasting marks on the national state of mind, (3) the war in Iraq has created additional uncertainty and fear in the mindset of the traveling public in all sectors, and (4) finally, but by no means least, the outbreak and spread of the Severe Acute Respiratory Syndrome (SARS) has resulted in anti-travel measures that are unprecedented in modern times. In order to induce people to travel, most sectors of the industry have reduced prices, with the result that such revenue as there is does not cover costs. As a result, firms are exiting in all sectors.

Each of these considerations would, by itself, have been enough to severely impact travel practices, but all four together have been simply overwhelming. The effects

of all four are still active and in the case of the economy and SARS may be worsening.

The dollar volume of air sales by travel agencies, who considering traditional and on-line agencies together, still account for a significant majority of sales, is in serial decline. The chart attached to this testimony shows the details. For present purposes it is enough to observe that agency sales of air travel have declined from almost $77 billion in 2000 to $57 billion in 2002. First quarter results indicate that the free fall is continuing. If we don't get some good news about SARS soon, the decline can be expected to deepen materially. It took about 18 months for air travel to recover from the effects of the first Gulf War and the 1991 recession, so recovery this time could be considerably longer.

The news on other fronts is similar. The National Tour Association, for example, had seven member companies fail in 2002, with similar expectations for this year. You will hear directly from the hotel and other sectors about the revenue problems they face.

The cruise industry, uniquely, reports steadily increasing embarkations from North America, but at significantly diminished yields. One of the successful initiatives was to reposition ships at new homeports within driving distance of major population centers, thereby making cruising possible without the need for air travel. New ship introductions are planned for 2003, as the cruise industry has successfully made the point that cruising is safe, affordable and available.

Those actions are consistent with the changed travel patterns of American consumers in the aftermath of the forces described earlier. In all sectors we are seeing travelers booking much later than before and traveling closer to home. ASTA's semi-annual surveys of traveler "hot spots" continue to show Orlando, Las Vegas, New York City as the three most popular domestic destinations booked by travel agencies. There appears to be a decided movement in favor of Mexico and Caribbean destinations for travelers on international vacations, though London, Paris and Rome occupy three of the top four international destinations identified by travel agents and two of the top five spots selected by consumer visitors to our web site.

So, with the notable exception of the cruise lines, the overall industry picture is very disturbing. Some major airlines are in or on the verge of bankruptcy. Services have been curtailed and tens of thousands of workers have lost their jobs. Travel agencies are affected in exactly the same manner by the same causes that have depressed the airlines and other tourism institutions, because travel agencies, traditional and online, account for most of the airlines business and for substantially all of the tour business. One bright light for us was the action of the House and Senate small business committees and the Small Business Administration (SBA) in the wake of September 11 to expand nationwide the SBA Economic Injury Disaster Loan program. That action saved the businesses of at least 500 agencies, who are now in repayment, with interest, on those loans.

That said, our part of the industry is not standing still and taking it. Since immediately after the September 11 attacks, we have been using every resource at our and anyone else's disposal to try to stimulate travel to safe destinations. Travel agencies as a group are very small businesses and typically lack the capital that larger tourism enterprises often possess. Nonetheless, they are long on creativity, and they have been busy, working through ASTA and on their own.

In March of last year a working group of travel agent organizations and airlines, in a program managed by ASTA on behalf of the Airlines Reporting Corporation, launched the Flight Plan for America campaign, a nationwide public interest program designed to reassure the traveling public about the commitment made to improve air travel security and convenience. Representatives of the Association of Retail Travel Agents, Southwest Airlines and Delta Air Lines, worked together to educate the public about travel in the new security environment, to encourage Americans to travel, and to promote the use of professional travel resources. United Airlines provided important assistance as well.

The centerpiece of Flight Plan for America was a public service announcement (PSA) featuring Captain Jim Lovell, Commander of Apollo 13, helping travelers understand what had been done to ensure their safety, what they could expect and what they could do to make their trips comfortable. A speakers bureau of travel industry leaders was made available to address travel industry topics in the news from the informed perspective of industry professionals. A Web site was created for travel professionals to help those in the travel industry use their expertise to educate their clients and the general public. Finally, a brochure was produced, entitled Tips for Today's Air Traveler, for travel professionals to distribute to their clients, with tips on what to pack and how to navigate the airport.

Our latest information shows that the Flight Plan PSA has been seen by about 100 million Americans and the radio exposure exceeds another 100 million persons.

Travel agents have united with other industry groups to promote National Tourism Week, and the SeeAmerica Program which starts next week. Agents have access to promotional materials on ASTA's web site and are encouraged to plan programs with others in their communities, including hotels, restaurants, and the local convention and visitors bureau to promote travel.

In addition, agents are independently planning events to help generate interest in travel and tourism. For example, one travel agency outside of Philadelphia is teaming up with a group of local photographers. Over a 3-week period travel-related photographs will be displayed at the agent's office. The agency will prepare a compendium on the artists and offer some door prizes. The public is invited to view the display which the agency is promoting through local advertising. Travel suppliers (cruise lines and tour operators) will be present to explain products and promote destinations. The beneficiary of the project is a local historic association—participants in the drawings get extra chances if they join the association.

ASTA is evaluating the feasibility of using this concept in a national promotion or contest to help agencies share their promotional ideas with each other, with hoped for multiplier effects in stimulating travel from communities around the country.

This summer, ASTA will be encouraging consumers to plan family reunions in domestic and international locations through a media campaign that includes video and audio news releases to consumer media. The program will suggest that families travel to interesting destinations for the best reunions.

ASTA's national advertising campaign in USA Today continues to promote cruise, vacation and travel opportunities. It has reached many millions of consumers during its two-year life. The latest development is that ASTA and Sandals and Beaches Resorts are teaming up in USA Today advertisements which encourage consumer travel by offering an unusual incentive: complimentary vacations for service men and women. Sandals, through travel agents, is giving away vacations valued at $1 million to those who are serving in the armed forces. If consumers book a 6-day vacation, the travel agent will be allowed to sponsor a 4-day, 3-night vacation for two among the military personnel in their community. Sandals will directly contribute another $1 million to service families for travel.

ASTA has continued to make the latest public relations and advertising tools available to travel agent members on ASTA's website, www.astanet.com. At no charge, ASTA member agents can download press releases, as well as black and white and color ads which encourage travel. The website now includes a Selling Center in which suppliers share with agencies the keys to selling effectively the particular products and promotions that are needed in these difficult times.

In closing, I want to return to the issue of government response to terrorism. Clearly the government must do everything reasonably in its power to assure the safety of the public and of travelers. To that end a new Department of Homeland Security has been created. We have worked in support of the National Tour Association and other industry organizations to urge the creation within DHS of an office to provide review and comment on the potential for serious travel disruptions arising from pending DHS rules and regulations. We believe it is vital to the recovery effort that, prior to the adoption of new rules, a full assessment of their effect on travel be made. In the end, of course, security considerations will prevail, but we want to be sure we don't create a system so sterile that no one is willing to use it.

Travel Agency Sales of Air Transportation

(In Billions of Dollars)

	2000	2001	% Change	2002	% Change	Mar-03 YTD	Prior Mar. % Change
Domestic Air Fares	51	42	-19	35	-16	9	-7
International Air Fares	25	22	-13	22	1	5	-14
Total Air Fares	76	64	-17	57	-10	14	-10

Mr. STEARNS. By unanimous consent, so ordered.

And, Mr. Walker, you are last but not least, and we welcome you.

STATEMENT OF MATTHEW S. WALKER

Mr. WALKER. Thank you, Mr. Chairman.

Mr. STEARNS. Move this over here.

Mr. WALKER. And thank you, Ranking Member Schakowsky, and members of the subcommittee.

My name is Matthew Walker. I am a General Vice President of the Hotel Employees and Restaurant Employees International Union, and I also ask if I might submit my full statement for the record.

Mr. STEARNS. By unanimous consent, so ordered, surely.

Mr. WALKER. We represent more than 265,000 members in the travel and tourism industry. The past 18 months have brought unprecedented hardship to this sector. Industry leaders have come to refer to the convergence of factors as a perfect storm In the wake of September 11, we saw at least one third of our international union's membership laid off and many thousands more forced to work drastically reduced hours, and while we had begun to see some signs of slow recovery, including healthier employment levels, that improvement has come to an end in the past few months.

At present we would estimate that more than 10 percent of our membership is out of work, with many more working reduced hours.

Moreover, layoffs in several markets appear to be intensifying. The reasons are well known. Operating profits in the hotel sector for 2003 are projected to come in slightly below the already discouraging performance in 2002. The only reason the downturn in profitability is not more severe is that the industry is engaged in unprecedented cost cutting.

Our union's information from markets such as Boston, New York, Washington, DC, San Francisco, Los Angeles, Chicago, and Honolulu is that more than 10 percent of our members are laid off with no short-term prospect of recall. Again, thousands more are working on greatly reduced hours, and as a consequence in some cases are no longer qualifying for medical coverage.

Let me also mention by way of sobering example what has happened this morning in Toronto as a consequence of the SARS outbreak there. Downtown hotels are 30 percent occupied on average. Typical this type of year they're running at 70 percent occupancy rates.

About one third of our unions' hotel work force has been laid off and many more are working short schedules. If the same crisis, heaven forbid, were to befall any number of major U.S. cities where tourism is the top or second ranking source of employment, the consequences would be equally horrific.

The decline in travel and tourism is a critical national problem. The hospitality industry is the largest employer of welfare to work program participants, the largest employer of single parents, the largest employer of new immigrants. This has driven the economic recovery of American cities over the last decade.

Our union supports the calls from industry leaders for a stimulus to get people traveling again, and we certainly applaud the appropriation of the $50 million for marketing the U.S. as a destination of choice for international travelers.

We join with those industry representatives who call for the restoration of the business meal and entertainment tax deduction, and we would also agree with the idea of restoring the spousal travel deduction.

We would point out, by the way, that these two measures taken together would cost less than 5 percent of the President's proposed tax cut, but at the same time, the industry's workers need help. These workers are one paycheck away from having hungry children, and two paychecks away from homelessness.

And most importantly, laid off hotel workers simply cannot afford health insurance. Medicaid is not positioned to absorb the burden, and given the dire physical condition of the States, there are no remaining viable alternative sources of coverage.

Therefore, the most important thing in our view that Congress and the administration could do for these workers is to provide Federal payment of COBRA health care continuation costs for a defined period, and we would suggest 12 months.

We also support extending and improving on the Federal unemployment assistance program so that more workers are covered and that those benefits do not start to expire next month.

And finally, we would support a temporary holiday from payroll taxes for employers and employees in this industry.

The Federal response to the travel and tourism industry's crisis post September 11 was woefully inadequate. Nothing was done about health care for the hundreds of thousands of displaced workers. As a result, huge numbers of newly unemployed were dumped into the already precarious public health system.

The temporarily extended unemployment compensation program established in March of last year offered only 13 weeks of extended benefits for the vast majority of workers, and it will start to expire next month at a time when the need will be as urgent as ever.

We told the poor in America to go to work, and they did in significant numbers. The hospitality industry is an industry of the working poor. Now their jobs are disappearing and so is their safety net.

Our message has to be that if you work hard and you play by the rules your family will be secure. Right now the message appears to be if your industry is suffering, you will suffer just as much, if not more so.

Thank you very much for the chance to testify.

[The prepared statement of Matthew S. Walker follows:]

PREPARED STATEMENT OF MATTHEW S. WALKER, GENERAL VICE-PRESIDENT, HOTEL EMPLOYEES & RESTAURANT EMPLOYEES INTERNATIONAL UNION

Thank you, Mr. Chairman, Ranking Member Schakowsky and members of the Subcommittee. My name is Matthew Walker and I am a General Vice President of the Hotel Employees and Restaurant Employees International Union. We represent more than 265,000 workers in various parts of the travel and tourism industry. The past 18 months have brought unprecedented hardship to this sector. Industry leaders have come to refer to the convergence of factors as a "Perfect Storm." In the wake of September 11, we saw at least one third of our International Union's membership laid off and many thousands more forced to work drastically reduced hours. While we had begun to see some signs of slow recovery, including healthier employment levels, the past few months have brought such improvement to an end. At present we would estimate that more than 10% of our membership is out of work with many more working a much shortened work week. Moreover, layoffs in several markets appear to be intensifying.

The reasons are well known. The overall state of the US economy, the war in Iraq, the fear of subsequent terrorist attacks and finally the alarm concerning SARS has slowed travel dramatically. Business travel, which is among the most lucrative for the hotel industry, is markedly down as is spending on banquets and food and beverage generally. As a consequence, operating profits in the hotel sector for 2003

are projected to come in slightly below the already discouraging performance in 2002. The only reason the downturn in profitability is not more severe is that the industry has been engaged in unprecedented cost cutting.

For example, Interstate Hotels the nation's largest independent hotel management company announced this month that it has eliminated 15% of its 38,500 jobs in response to the industry-wide downturn. Our Union's information from markets such as Boston, New York, Washington, DC, San Francisco, Los Angeles, and Honolulu is that more than 10% of our members are laid off with no short term prospect of recall. Again, thousands more are working substantially reduced hours.

Let me also mention by way of sobering example what has happened this month in Toronto as a consequence of the SARS outbreak there. Downtown hotels are 30% occupied on average when typically they are 70% full this time of year. About one third of our Union's hotel workforce has been laid off with many more working short schedules. If the same crisis, heaven forbid, were to befall any number of major US cities where tourism is the top or second ranking source of employment, the consequences would be equally horrific.

The decline in travel and tourism is a critical national problem. The hospitality industry is the largest employer of welfare-to-work program participants—the largest employer of single parents—the largest employer of immigrants. According to the National League of Cities, the hospitality industry is cited by city leaders more than any other industry as critical to the economic development and well-being of their city.

Our Union supports the calls from industry leaders for stimulus to get people traveling again and certainly applauds the passage of the $50 million marketing package to position the US as a destination of choice for international travelers.

We join with those industry representatives who call for the restoration of the business meal and entertainment tax deduction. We would also agree with the idea of restoring the spousal travel deduction. We would point out that these two measures taken together would cost less than 5% of the President's proposed tax cut plan.

But at the same time, the industry's workers need help. These workers are one paycheck away from having hungry children and two paychecks from being homeless.

Most importantly, laid off hotel workers simply cannot afford to continue their health care coverage. Medicaid is not positioned to absorb this burden and, given the dire fiscal condition of the states, there are no remaining viable sources of coverage.

Therefore, the most important thing Congress and the Administration can do for these workers is to provide Federal payment of COBRA health care continuation costs for a defined period of time—we suggest 12 months.

The COBRA system is an existing, simple, efficient, well-defined, private-sector mechanism to accomplish Federal payment to health plans—both corporate and Union plans—which agree to cover laid off workers for a defined period of time. It does not require any new entitlement or bureaucracy. When the defined period of time is over, the program simply ends.

We also support extending and improving on the Federal unemployment assistance program so that more workers are eligible for federal benefits and those benefits do not start to expire next month.

Finally, we would support a temporary holiday from payroll taxes for employers and employees in this hard hit industry. If such a holiday were implemented, we would include two caveats. Such relief should be accompanied by a substitute appropriation so as not to further jeopardize the already vulnerable Social Security Trust Funds. Also, such a holiday does not address the dire needs of the already unemployed and should not be seen as a substitute for measures aimed at helping those currently out of work.

The federal response to this industry's crisis post September 11 was woefully inadequate. Nothing was done about health care for the hundreds of thousands of displaced workers. As a result, huge numbers of newly unemployed were dumped onto the already precarious public health system. The Temporary Extended Unemployment Compensation (TEUC) program established in March of last year offered only 13 weeks of extended benefits for the vast majority of workers and it will start to expire next month at a time when the need will be as urgent as ever.

We told the poor in America to go to work and they did in significant numbers. The hospitality industry is an industry of the working poor. Now their jobs are disappearing and so is their safety net. Our message has to be that if you work hard and play by the rules, your family will be secure. The message that travel and tourism workers are getting at the moment is: "If your industry is hurting, so are you . . . only moreso."

Thank you very much for the opportunity to testify before you this afternoon.

Mr. STEARNS. I thank you, Mr. Walker, and I think to all the folks who testified, it would probably be appropriate for them to know that Chairman Alan Greenspan is testifying in the Financial Services Committee today, talking about the economy. He perhaps should have been listening to you this afternoon. He would have had an even better and clearer picture of where the status is of this important industry.

I think what I hear from all of you is that this letter that I've written to Secretary Evans asking for a Presidential Advisory Council on Travel and Tourism, that you agree, particularly in light of the fact that the United States was the No. 1 tourist attraction and now follows behind Spain and France.

I think when I try to hear some of this bad news obviously that you folks are talking about, what is the one thing as a legislator we, my colleagues and I, could do? And going back to my opening statement, this international tourism provides so much more than the commercial. We want to spur on the tourism in America for people to go within the United States, but we would like to attract a lot of the international tourism because that provides much more, bigger impact for the buck.

And so the idea of this $50 million being made permanent as part of the budget to help advertise the United States, and as I pointed out Spain is spending $150 million, and they have 5 percent of our GDP. So certainly the United States certainly could spend $50 million to see how effective it would be.

But Mr. Walker has talked about this perfect storm, the 9/11, the economy being weak even before that, the terrorist threat that continues, the war with Iraq, homeland security, and all of the bothers that a lot of people perceive going to the airport. Mr. May knows from the number of airlines both for transportation as well as commercial includes all of the major airlines, American West, American Airlines, Delta, U.S. Air, Emory Freight. Even I guess you have some associate members from Canada and Mexico, Royal Dutch Airline.

So the problem with the airports and waiting in line, the idea of homeland security, and then last, of course, to have SARS coming up, this has almost created the perfect storm.

So now what can we as legislators and what can you as industry leaders do? And I would say that the concentration should be on that international tourism and bringing the people here to say, one, it is not going to be a hassle in the airport because we are going to have iris scans. We are going to have fingerprints. We are going to have anything to expedite. So the homeland security should expedite the whole process of getting people through the airlines quickly, and we have the technology to do it.

Two, we have got to provide safety to the international travelers that come here that there is not a threat from SARS, there is not a threat from the terrorist attack, and that all can be gotten now through this $50 million that we do through the Presidential Advisory Council on Travel and Tourism.

So there are lots of things we could do, I think, to attract more international tourists. Our immigration policy has perhaps dampened a little bit of people coming in here because it is a little bit

of a hassle and all of the extra interrogation and things that go with it.

So this international tourism, it seems to me, is an indispensable action or condition that perhaps would jump start this more quickly than anything else. So my question to you is: you're a policymaker. What one thing, and I will just go from my right to left; what one thing would you do if you could advise the Advisory Council or you had the power and you were President?

Because, frankly, what we do in this travel and tourism industry affects the economy dramatically, and the fact that we had a $26 billion surplus when we had almost a $450 billion deficit in trade, to see this when we were the No. 1 and see now this surplus go down to $8.6 billion in the year 2001, it is so positive; it is so clean; it is so powerful on input that I think the President should realize that with not a lot of work we can jump start this and the international travel.

So I guess I am asking for each of you to give the one thing you as President think we could be doing to help your industry.

Mr. LUNDBERG. Well, from the standpoint of the U.S. Chamber, Mr. Chairman, not to diminish the importance of the $50 million appropriations to the Department of Commerce and the importance of——

Mr. STEARNS. No, I need your candid opinion, you know, whatever subject or whatever way you think.

Mr. LUNDBERG. The No. 1 item that I perhaps would focus on is given the disparity of the travel and tourism industry as a whole, it covers, as you can see, just from the representation at this table such a broad diversity of sectors within the travel and tourism industry. I think the establishment of the Presidential Advisory Council is key to bringing together all of the various agencies that have some piece and some impact on travel and tourism and bring it together under one entity to vet issues, to vet policy, nd then to be able to go forward and implement that policy in a unified way from the standpoint of the administration.

Mr. STEARNS. Mr. May.

Mr. MAY. Mr. Chairman, I think that certainly within the context of this overall economy we have to do whatever we can to strengthen the economy because that is going to add a lot to travel and, therefore, the domino effect that people have been talking about.

I think we have to also as a part of that help people understand it has never been safer to fly, that our security measures are better today than they ever have been. We have to increase and take measures to increase consumer confidence.

And finally, I would suggest, if I can be permitted a parochial moment, that we need to promote international travel on U.S. flag carriers.

Mr. STEARNS. I thank the gentleman.

Mr. Edwards.

Mr. EDWARDS. Thank you.

Briefly I would suggest obviously the economy needs a jump start. There is no question that that has to be moved on on a unilateral basis, legislative and private sector.

No. 2, I would have to endorse a team approach. I do not mean to sound like, you know, the NBA here, but a team approach, legislative, private sector, everyone.

This Presidential Advisory Council on Travel and Tourism is established. It is there. It is functional. It is a universal entity, and I think your $50 million and other expenditures maybe in the future toward image making to bring the people to this country would be a primary step and using this as your vehicle would eliminate a lot of the ambiguities of all of the different pieces that are moving parts and moving targets.

I think this would be the entity to use. I would pursue it very strongly and make sure you have the top CEOs that are involved in the industry as part of the left hand as advisors here to give direction.

Mr. STEARNS. Mr. Robinson.

Mr. ROBINSON. Yes, thank you.

I think I would like to comment on this $50 million. We appreciate that that expenditure has been allocated. It is terribly important, I believe, since this is an experimental phase this first year that it is used wisely and that we focus carefully on what it might be used for.

And I agree entirely with you on the proposal to focus on international travel. However, historically it has been very interesting because the majority of visitors who come to this country that really return and spend larger dollars come from certain countries, and they are Great Britain, Mexico, Canada and Japan. And I think it is important if we can focus on a few countries and not try to, you know, cover the world, so to speak; that it will be a lot more effective in what we are able to bring to fruition.

Thank you.

Mr. STEARNS. That is a good idea, to focus down on where experience-wise has shown us to be where the best source of money.

Mr. ROBINSON. That is correct.

Mr. STEARNS. Yes. Mr. Sternberg.

Mr. STERNBERG. Well, Mr. Chairman, as I always tell my managers, action is always better than inaction. So now that we have appropriated this $50 million, let's do something with it.

And I think the first step in that is establishing the Presidential Advisory Council so that the money can be well spent and used wisely, but having appropriated it is the first step. Using it is the second.

Mr. RUDEN. Mr. Chairman, I do not think I can help much on the $50 million because I think most of that, if not all of it, is going to be spent overseas, and that money will at best indirectly assist the travel agency sector of the economy.

But I do think that, to go back to the point that I made at the end of my earlier testimony, it is most important here that we not do unto ourselves that which we are trying to stop coming from other places, and I do not think we have established an appropriate mechanism yet for fully evaluating all of the consequences of all the things that are proposed to be done about security and other related issues.

Security will always be first. No one is suggesting otherwise. But I think the government, whether it is at the Presidential level or,

in our view, probably closer to the ground, it should be at the Department of Homeland Security. This industry has got to work in a unified way with the government to take account of the consequences of some of these actions that the government takes.

And as a passing thought, I would also say to my colleagues here at this table and anyone else who might listen in the future this industry is divided because of internal conflicts within it, and as long as we remain divided and not talking to each other about these things, having government places to go and talk is not going to solve the problem. We have to get over the fractionalization and fragmentation within our own house in order to truly solve these problems.

Thank you.

Mr. WALKER. Thank you.

We certainly support the appropriation of funds for interim promoting the United States as a destination of choice. I think there is no question that increased international travel will help to catalyze the recovery, as would some of the other restorations of tax deductions that we talked about.

However, there is a crisis that befalls the workers in this industry, in particular, and the crisis that the travel and tourism sector is experiencing has been recognized by this subcommittee. I think I would reiterate that most importantly we need to figure out some way to have at least a short term measure for continuing health care benefits for the workers in this industry.

The COBRA is an existing, simple, efficient, and well defined private sector mechanism for both corporate and union pension funds that agree to continue coverage. There could be an opportunity here for Federal coverage of those COBRA payments without any new entitlements or bureaucracy, and after a 12 month period, it would simply cease.

And so I would ask the subcommittee consider this.

Mr. STEARNS. I think my time has obviously expired.

The Ranking Member for questions.

Ms. SCHAKOWSKY. Thank you, Mr. Chairman.

And I thank each and every one of you for excellent testimony and agree with many of the proposals that have been laid out.

I hope you'll forgive me by just noting that the incredible diversity of the industry that you represent may not be best reflected by this panel and to note that you do represent one industry which is most diverse, particularly when you're talking about employees at the lower level of perhaps any industry and certainly among consumers, people from all over the globe and almost all Americans here at home.

And you will perhaps forgive me for this, too, but it seems to me we can spend $50 million, but when we do things like—oh, I do not know—rename french fries and engage in name calling, I think we will have to use some of that kind of money to make up some of the ground that we inflict on ourselves in some of the things that we do, and I want to further explore one of the other things that we do.

But I also wanted to note that while, Mr. Walker, you are here representing HERE and your union membership, you are also here supporting the proposals that the entire industry, management and

everyone, all of the different sectors support. What I am interested to know from the rest of you is the specific recommendations that Mr. Walker has mentioned for the workers in this hardest hit sector, Federal payments of COBRA health benefits, temporary holiday from payroll taxes, extension of temporary extended unemployment compensation; I am wondering if these are proposals that your organizations and member businesses could support.

If I could hear from each of you. Mr. Lundberg.

Mr. LUNDBERG. Yes, the Chamber has, of course, looked at all of the specific items mentioned by Mr. Walker, and we do support closely examining COBRA, and on payroll taxes, I do not think we have really come down on that issue yet.

We did support the extension of unemployment compensation.

Ms. SCHAKOWSKY. Thank you.

Mr. MAY. ATA as an organization has not taken any formal positions. However, we did work actively with our union partners as part of the cost-of-war supplemental to extend unemployment benefits, and where it makes sense to do that in the future, we certainly would.

Mr. EDWARDS. I can tell you that AH&LA, American Hotel & Lodging Association, has in the past and do now. We do support continuing unemployment benefits. As we experienced after 9/11, we tried to carry it privately ourselves in the case of my company. In others, we carried it for a number of months because of the sudden impact, but you will find that AH&LA will, in fact, continue to support unemployment benefit extension.

Ms. SCHAKOWSKY. And what about the COBRA?

Mr. EDWARDS. I can probably answer that that we would probably extend that also and support it.

Mr. ROBINSON. As an association, we do not really establish positions with respect to those kind of issues. However, we are an industry that hires a great deal of young people and single people, and so I think we would want to benefit them in any way that we could.

Thank you.

Mr. STERNBERG. With an industry of 11.7 million employees, obviously employees are the heart and soul of our industry, and it is an incredibly diverse work force that we represent. We obviously enthusiastically support anything that helps those employees.

Mr. RUDEN. Well, in the travel agency business, of course, we have also laid off an enormous number of workers, most of them women who are the dominant employees, and I think probably also the predominant owners in the business, and we have had a lot of the small businesses simply go out of business because they cannot make it in the current environment.

So anything that would ease the impact of that we would certainly support. I cannot really as an association address the COBRA thing per se, but I think the principle is correct, that if you just leave those people to suffer the consequences without any focused attention on the unique circumstances that they face, whether they are former owners of small businesses or individual employees who have nothing to fall back on, I think you meet yourself coming the other way when you try to stimulate the economy. It is not going to work.

So those kinds of recommendations need to be very thoroughly looked at.

Ms. SCHAKOWSKY. Well, in terms of stimulating the economy, perhaps one of the most important things we could do in terms of bang for the buck is, in fact, extending unemployment insurance benefits, for example, which for each dollar generates about $1.73 back into the economy. So I think we could be doing the entire economy a bit of good when we help out the workers in all of your industries.

If I could, Mr. Chairman, I had one other area I wanted to pursue briefly.

On April 21, NPR had a story that I kind of live with every day and you do, too. The Commerce Department reports business and pleasure travel to the U.S. from abroad has declined 28 percent over the past 2 years. In part, it is because of the slow international economy, but another factor and one that concerns the travel and tourism industry is that it is becoming increasingly difficult for foreign visitors or for foreigners to visit the United States.

And several of you referred to that, and again, even if we were to spend $50 million, I spend a lot of my time on the telephone at very weird hours of the night and early morning calling embassies all over the globe, trying to help relatives or friends of constituents of mine, people who are hosting conferences in Chicago who would like foreign visitors to be able to come, and what I have found is particularly since September 11, that there has been a real culture of "no" from these embassies.

And so what I am asking specifically is: would you support changes to our system that welcomes visitors, that decreases the time it takes to process a visa, and a culture where those who have been thoroughly screened are now welcomed into this country? And is that a priority for your organizations?

Again, just quickly or if you don't have anything to say about it, fine, but if you do, I would like to hear it.

Mr. EDWARDS. I guess I will start.

Mr. STEARNS. If you would, please.

Mr. EDWARDS. We had an interesting experience this past fall. We run a trade show for the 30,000 attendees from over 100 countries, and I know we spend a good deal of time on the phone trying to get visas to get not only attendees in, but manufacturers to bring equipment into the country for that very reason, and it is a difficult process. It is becoming more difficult, and we could use some help in that area, but very definitely.

Mr. LUNDBERG. Anybody else?

Mr. RUDEN. I would offer the thought that anything that increases the actual out-of-pocket cost or the psychic cost of traveling is devastating, especially now when everyone is kind of fragile to begin with.

And so I travel a lot around the world and in the United States by various methods. When you encounter the attitude of "I am here to block you, to test you," as opposed to the attitude of "I am here to facilitate your going through, but first we have some things to do," those two differences in attitude make a huge difference in the psychic impact on the traveler.

And when people feel that they are going to have to run a blockade and that there is an attitude of blockage as opposed to facilitation, many people will be turned away from it. They do other things with their time and other things with their money that will not be as helpful to the economy.

It is very important for our government, both for Americans traveling internally and leaving the country and those who wish to come here, to solve that problem.

Ms. SCHAKOWSKY. Thank you.

That is all of my questions. If I could just end with this though, while all of us, I think, are dedicated to making sure that we protect the security of our people, there is a balance that needs to be struck, and it seems to me that that balance has not been achieved right now, and that we need to work to do that, to maximize the opportunity of people who just want to enjoy our great country and all that it has to offer, to be able to come here.

Thank you.

Mr. STEARNS. I thank my colleague.

The gentleman from Ohio, Mr. Strickland.

Mr. STRICKLAND. Thank you, Mr. Chairman, and I apologize that I have not been here for everyone's testimony because I have had some other responsibilities.

But I represent an Appalachian rural area, and most of the small towns of my district are not considered tourism destinations, but I understand the value of this industry to our Nation and to our Nation's economy, and I understand that my colleague from Illinois raised this issue a little earlier, but I would just like a chance to speak to it as well.

I am concerned about how we may be perceived as a nice place to visit, given some of the reactions that have occurred here in the Congress, which in my judgment have been, at best, immature.

I a couple of years ago spent some time in Barcelona. Spain is a great place to visit. I can understand why people would go there. I have also been to Paris, and Paris is a great city. France has much to offer.

But this country does as well, and I am wondering if we should do more to create a friendly face for the person who may choose to travel here.

I also have had some experience as a Member of Congress interacting with some of our foreign embassies, and if the foreign tourist has had some of the interactions with the staff and some of our embassies that I have had, then I can understand why there could be some perceptions that are negative.

But without a doubt, this is an important industry that you represent, and it is not, I think, a narrow interest that you are trying to describe today, but it is a problem that is a part of this larger economy, but a vital part of it, and I think we have to do whatever we can in a reasonable manner to help you.

And, Mr. Walker, I was really struck by one phrase you used, that many of your members are one paycheck away from hungry children and two paychecks away from homelessness. I think what we are facing is a crisis.

And other than what has already been discussed here by our good Chairman and others, I guess my only question would be, and

it would be a final question: is there anything that has not been pointed out here today or you have not had an opportunity to say in regard to what you think we can do as a Congress to be helpful to you, or have you had your say and are you ready to call this to an end?

[No response.]

Mr. STRICKLAND. Thank you, Mr. Chairman.

Mr. STEARNS. I thank my colleague.

We have four votes. So we are going to close, and I think as a result of the hearing today, we are going to draft legislation to make a Presidential Advisory Council of Travel and Tourism sort of permanent, and I think that is one of the things that has come out of this hearing.

But I just want to ask Mr. Edwards one question. I note he has 30 years of experience with economic climate in the hotel-travel industry. Have you ever seen anything this bad or you have seen worse before?

Mr. EDWARDS. Let's put it this way. I have had the same question from the president of my company. I said I never realized my job description between snipers, anthrax, wars, and I mean, I can go through the whole litany, has ever been this way.

And the answer in all honesty is no. My father was with Hilton in Chicago for his entire life. You have recessions. I do not want to Osama bin Ladenize the economy. That was the final blow, but the economy needs a kick start.

I personally have not seen a spiral of this nature, in all honesty, and a difficulty in managing the ambiguities. If it is coming from the left, you are getting hit from the right. I mean, it is kind of perpetual.

And to answer your question, that is a long answer to say no. I have not personally experienced it.

Mr. STEARNS. I think that is what I sense, and Mr. Walker mentioned a perfect storm here, and so I think my colleagues should be very keenly aware of how important this industry is and anything we could do to help we will do it.

I think this hearing is another step forward. So I want to thank all of you. I know how valuable your time is, and I want to thank the participation from my colleagues, and thank you again for coming.

And the hearing is adjourned.

[Whereupon, at 2:41 p.m., the hearing was adjourned.]

[Additional material submitted for the record follows:]

PREPARED STATEMENT OF HON. JON PORTER, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF NEVADA

Thank you Chairman Stearns for giving me this opportunity to submit a statement for the record. Tourism is one, two, and three in every state and I am glad to see this subcommittee focusing on its importance. We must develop a national approach, incorporating all 50 states, to promote tourism globally. This is the beginning and not the end of many efforts to come and I am anxious to hear our witnesses' thoughts and ideas.

Las Vegas is considered one of the most traveled to destinations in the world, earning its designation as the Entertainment Capital of the world long ago. Las Vegas has something to offer people of all ages. Everything from world class resort-casinos, to first class restaurants and shopping, and entertainment which includes concerts, production shows, and magic acts. Approximately 35 million people visited Las Vegas in just 2002 alone.

Despite the slow economy and unprecedented challenges to the tourism industry, the commercial gaming industry in 2001 continued to be an important contributor to the U.S. economy, growing nearly 5 percent, providing more than 364,000 jobs with wages of $11.5 billion and paying $3.6 billion in taxes to state and local governments.

The tragic events of September 11th affected nearly every business sector in America, but they hit those in the hospitality industry particularly hard. We in Nevada have united and come a long way to overcome the devastating effects but we still have a long way to go. Nevada, the gaming industry's flagship, suffered the most of the commercial casino states, recording its first annual revenue decrease since 1981. Nevada's commercial casino industry is so vital to the health and wellbeing of the state's economy. In 2002, the commercial casino industry grossed $9.5 billion and paid $688 million in taxes just for the state of Nevada. This tax revenue helps provide critical support to the state, which include funding schools, social services, transportation needs, and parks and recreation programs.

Despite popular belief, the commercial casino industry is not the only important money maker in town for the state's tax revenue. Las Vegas hosts the lion's share of Tradeshow Week's Top 200 largest conventions and rents more convention space than any other city in America. In 2001, 4 million convention and trade show delegates traveled to Las Vegas, generating $4.8 billion in non-gaming revenue. Currently, Las Vegas has more than 7.5 million square feet of convention and meeting space, including the Las Vegas Convention Center's 1.3-million-square-foot south hall expansion. Available convention space will increase significantly upon completion of Mandalay Bay's 1.8 million-square-foot conference center, which opened this year.

Lastly, I would like to discuss the health of the nation's airline industry. As we all know, keeping America's airlines out of bankruptcy is critical to maintaining the health of the tourism industry. Historically, there has been a strong correlation between room occupancy and air service, especially to Las Vegas. Of the 35 million visitors to Las Vegas in 2002, nearly all of them traveled to Las Vegas by air. We must ensure we are doing everything we can to help the airlines stay out of bankruptcy.

Again, Mr. Chairman, I appreciate this Subcommittee for having hearing and the opportunity to share my thoughts on this vitally important industry to my state, as well as the entire country.

PREPARED STATEMENT OF THE TRAVEL INDUSTRY ASSOCIATION OF AMERICA

The Travel Industry Association of America (TIA) appreciates the opportunity to present this testimony regarding the current state of the U.S. travel and tourism industry. Chairman Stearns, Ranking Member Schakowsky and members of the subcommittee, TIA applauds you for holding this important hearing to more closely examine where the travel industry stands as it strives to recover from terrorist attacks on our nation, a depressed economy and a war in Iraq.

TIA is the national, non-profit organization representing all components of the $537 billion U.S. travel and tourism industry. TIA's mission is to represent the whole of the travel industry to promote and facilitate increased travel to and within the United States. Our 2,100 member organizations represent every segment of the industry, and are dedicated to helping grow the U.S. economy and provide jobs and economic opportunity for individuals and communities all across America.

During the past twenty months, our nation has experienced several historic events that have had a major impact on the overall economy, and the U.S. travel industry has been disproportionately affected. In 2002, the U.S. travel industry generated $537 billion in visitor spending, far below the record $570.5 billion in expenditures in 2000. While the travel industry employs nearly 8 million people directly in the U.S., 387,000 jobs have been lost in the industry since September 11, 2001. Stated more dramatically—the U.S. travel industry employs 6% of the American workforce, but 30% of all jobs lost since 9/11 have occurred in the travel industry.

Fear of terrorist attacks, concern about traveling during wartime and a soft economy have all combined to drag down international travel to the U.S. and domestic business travel within the U.S. The only bright spot has been domestic leisure travel, which still lags behind record levels in 2000, but has shown some positive growth (1.7% increase in 2002 over 2001).

Americans are flying less, driving more frequently to their destinations, and are now waiting until the last minute to book their trips. Americans are less likely to travel overseas due to terrorism and other concerns. Reduced outbound travel may help in some small way to boost domestic travel in the U.S., but this will not have

a major impact since U.S. travel abroad rarely exceeds 5% of total U.S. visitor spending.

With the short duration of the war in Iraq most economists expect the economy to gain momentum. Once the situation in Iraq stabilizes, businesses will likely resume spending and hiring, which will boost consumer confidence and economic growth, as well as consumers' willingness to spend, including for travel. In fact, on April 28 the Conference Board reported the single largest gain in consumer confidence in the U.S. since the end of the Gulf War in 1991. In the absence of terrorist attacks here in the U.S., Americans are likely to be anxious to resume leisure travel as soon as possible and may even boost their travel significantly because of pent-up demand.

International travel to the U.S. remains a major concern since declines in visitation from major markets continues to be significant. Over the last decade, the U.S. share of worldwide travel has declined by 30%. The events of 9/11 have only served to reinforce this negative trend. Total international arrivals in the U.S. declined 7 percent to 41.9 million in 2002 compared to 2001, according to figures just released by the Department of Commerce, Office of Travel and Tourism Industries.

To highlight how dramatic the drop in international travel to the U.S. has been, consider the following figures. Over the last two years, travel to the U.S. from the United Kingdom has declined by nearly 19%, while Japanese travel has fallen off 28.3%. Our largest market in Latin America, Brazil, has seen a decline of 45% during this two-year time period. Total overseas arrivals (excludes Canada and Mexico) were reduced by 26.4% during this time period. As international travelers typically take longer trips and spend considerably more per trip than domestic travelers, this decline has had a dramatic economic impact on many cities and states in the U.S.

We believe that several of the TIA's top public policy goals would greatly assist in moving the industry forward and helping to grow both international travel to the U.S. and domestic travel within the U.S.

PROMOTING INTERNATIONAL TRAVEL TO THE U.S.

TIA and its members are delighted that Congress has recognized the value of investing in inbound tourism and appropriated $50 million appropriation as part of the FY 2003 Omnibus Appropriations package for international tourism promotion. We believe this initiative is an important first step in creating a multi-year sustained and coordinated national campaign to promote the U.S. as the world's leading visitor destination. We are grateful to Congress for taking this important action.

Other nations have long recognized the value of promoting themselves throughout the world under the banner of a single brand. Reaching out to global travelers through a unified promotional campaign is our industry's best hope for reversing this decade-long decline in our nation's share of worldwide travel. A long-term authorization and appropriation to fund a public-private partnership between industry and government to carry out this mission remains one of TIA's top priorities.

In order to achieve real success and increase international visitor levels to the U.S., we believe such a promotion campaign should target a few select international markets, be invested in a way that will achieve the highest possible return on investment and should appropriately utilize a national brand to maximize industry participation. These principles apply to the initial campaign making use of the $50 million that has already been appropriated and any future campaigns that may be funded by the federal government, working in partnership with the U.S. travel industry.

FACILITATING INBOUND INTERNATIONAL TRAVEL: A BALANCED POLICY APPROACH

Unfortunately, the most sophisticated and well-funded promotional campaigns will be for naught if the U.S. adopts policies and procedures that impede inbound international travel to the U.S. While TIA and its members have strongly supported reasonable measures to enhance homeland security, we also believe very strongly that U.S. government policy must strike a proper balance between national security and economic security. Additional scrutiny that weeds out those who would seek to enter to the U.S. to harm this nation is critical, but at the same time the federal government must proceed with caution and not adopt policies that deter legitimate international travelers from visiting the U.S. for leisure or business purposes.

Retention of the Visa Waiver Program remains one of the cornerstones of TIA's travel facilitation agenda. This program permits visitors from 27 key nations to visit the U.S. for up to 90 days for business or pleasure without having to obtain a non-immigrant visitor visa, and encourages inbound travel from key markets in Europe and Asia. The General Accounting Office issued a report last year that concluded that elimination of the program would not guarantee greater national security, but

would surely cost the industry billions in lost revenue and would require the federal government to spend large sums of money to restaff consulates and embassies in these 27 Visa Waiver program countries.

A more streamlined visa issuance process is also needed to help facilitate international travel to the U.S. The number of non-immigrant visa applications worldwide fell by nearly 20% over the past 12 months, and while a soft world economy is chiefly to blame, the travel industry is also concerned that long delays in visa processing and issuance have also served to discourage visitors from trying to obtain a visa in order to travel to the U.S.

FUNDING FOR SAFE AND EFFICIENT ROADS: FEDERAL HIGHWAY REAUTHORIZATION

Another major priority for TIA and its members in 2003 is support for increased funding for the federal surface transportation program. Overall funding for highway improvements is our industry's number one priority for highway reauthorization. Approximately 83 percent of all person-trips take place on U.S. roads. This includes approximately some 70 percent of business person-trips. It is critical for all types of travel that our nation's highways, bridges and tunnels be safe and efficient and that our nation's surface transportation system be able to handle increasing amounts of travel. National mobility is essential to ensure continued growth in travel and tourism.

TIA also supports increased funding for several key highway programs, including the National Scenic Byways Program, Transportation Enhancements and the Federal Lands Highway Program. We are currently partnering with the Federal Highway Administration to promote increased travel along our nation's 20 All-American Roads and 75 National Scenic Byways through the *SeeAmerica's Byways* program.

VISITOR ACCESS TO PUBLIC LANDS

As leisure domestic and international leisure travel continues to rebound in 2003, there may be renewed calls for limiting visitor access to national parks, forests and other public lands. These public places with their scenic and historic significance are important destinations for both U.S. and international visitors, and TIA will continue to work with other tourism and recreation organizations to ensure open visitor access to these important places in America.

CONCLUSION

While recent economic and international developments provide a glimmer of hope for the U.S. travel industry, full recovery will not come for several years. Some industry leaders have even argued that September 11 and subsequent events have forever altered some aspects of travel—especially business travel. TIA will continue to lobby vigorously for policies that will permit the U.S. travel and tourism industry to recover, thereby providing additional jobs for Americans, economic opportunity for both urban and rural communities and tax revenues for all levels of government. We thank you for holding this hearing and look forward to continuing our work with this subcommittee and all of Congress to ensure we have the support necessary to face the challenges of rebuilding one of America's key industries.

We respectfully request that the April 9, 2003 joint letter from TIA and TBR to Secretary of Commerce Donald L. Evans, concerning the $50 million appropriation for international tourism promotion, also be made a part of the record for this hearing.

TRAVEL BUSINESS ROUNDTABLE

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TESTIMONY SUBMITTED FOR THE RECORD BY THE TRAVEL BUSINESS ROUNDTABLE

BEFORE THE SUBCOMMITTEE ON COMMERCE, TRADE AND CONSUMER PROTECTION HOUSE COMMITTEE ON ENERGY AND COMMERCE

HEARING ON "TRAVEL AND TOURISM IN AMERICA TODAY" WEDNESDAY, APRIL 30, 2003

OVERVIEW

The Travel Business Roundtable (TBR) would like to thank the Subcommittee for holding this important hearing, and is pleased to have the opportunity to submit testimony for the record regarding the current state of the U.S. travel and tourism industry. TBR is a CEO-based organization that represents the broad diversity of the industry, with more than 80 member corporations, associations and labor groups. Travel and tourism is one of America's most dynamic industries, and an embodiment of the service sector that has emerged as the dominant economic driver for the U.S. in the 21st century. Our industry creates jobs and careers, employing nearly 18 million Americans. In 2001, we produced $98.8 billion in federal, state and local tax revenues. We are the second largest service export, generating an annual balance of trade surplus for the U.S. of $8.6 billion that same year. We are in 50 states, 435 congressional districts and every city throughout the nation.

CURRENT STATE OF THE INDUSTRY

Over the past year-and-a-half, the travel and tourism industry has faced significant challenges on several fronts. This Subcommittee has held a number of hearings on the plight of the industry since the terrorist attacks of September 11, and TBR would like to thank Chairman Stearns and Ranking Member Schakowsky for their continued engagement on issues of concern to the industry. As you are all aware, it became apparent very quickly during the days and weeks following September 11 that the problems facing our industry were not simply airline-related. When people stopped flying – or in many cases traveling by any mode of transportation – they also stopped staying in hotels, eating in restaurants, visiting museums or theme parks, renting cars or shopping. As a result, hundreds of thousands of travel and tourism industry workers were laid off or had their hours reduced, travel and tourism companies faced steep revenue shortfalls and state and local governments saw a rapid decline in tax revenue upon which they were particularly reliant in the recessionary economy.

Though lower prices and increased security measures have helped get Americans traveling again, international conflict, the ongoing economic uncertainty in the U.S. and the perceived "hassle factor" associated with travel remain barriers to the industry's recovery, and the slight recovery we saw in some industry sectors and areas of the country over the past 18 months was uneven. While many industry workers are back on the job, some continue to work reduced hours and there are some reports that more than half of all jobs lost since September 11 are in aviation and travel. Several recent factors, including the war in Iraq, heightened concerns about possible terrorist acts within our borders, the troubling spread of severe acute respiratory syndrome (SARS) and continued economic uncertainty have in many cases slowed or reversed any recovery that was occurring in the industry. As a result, individuals and

businesses continue to cut back on discretionary spending, including travel. Vacations are being shortened or canceled altogether and businesses continue to reduce or eliminate travel. In addition, international arrivals are still lagging behind pre-September 11 levels.

Here are just a few examples of what we are seeing across the industry:

- Hotel occupancies declined to an average of 59.2 percent in 2002, down from 60.3 percent in 2001 and 63.7 percent in 2000.
- Business travel is expected to decline for the fourth straight year. The number of business trips this spring is expected to be 2.5 percent below last year's levels and 13 percent below 2001 levels.
- The restaurant industry, which is the nation's largest employer outside the federal government, reports that as of March 2003, employment is down 244,000 jobs from July 2001.
- The airline industry sustained $11 billion in losses last year. At present, domestic advance bookings are down 20 percent, and transatlantic bookings are down 40 percent.

With respect to the airline industry, TBR would like to express its appreciation to Congress for including provisions in the FY03 wartime supplemental appropriations bill to help the airlines. The $2.4 billion in grants to offset the significant security costs airlines have absorbed since September 11; extension of unemployment benefits for airline industry-related workers; and extension of the War Risk Insurance Program will provide much-needed assistance at a crucial time. TBR's members recognize the integral importance of the sustainability of the airlines to the overall health of the industry, and we support reasonable federal assistance measures, particularly as they relate to necessary security costs. TBR also supports the timely reauthorization of the all three significant federal transportation bills that Congress is considering this year: the Aviation Investment and Reform Act for the 21st Century (AIR-21); the Transportation Equity Act for the 21st Century (TEA-21); and Amtrak, and the adoption of federal policies that will strengthen and provide vitality to all of these critical modes of transportation.

It is extremely important to note that the employees and owners of travel and tourism businesses are not the only ones affected by the downturn in tourism. Cities, counties and states that were already beginning to see budget shortfalls due to the stagnant economy have also been deeply affected by the decline in the tourism and sales tax revenues that visitors bring to their jurisdictions. Forty-one states and hundreds of cities are currently experiencing major budget shortfalls, and Governors and mayors often cite a dramatic decline in travel and tourism tax receipts as a major cause. As a result of these revenue declines, states and local governments have been forced to reduce essential services at exactly the same time their citizens – who are also feeling the effects of the economic slump – require more assistance.

RECOMMENDATIONS

The Travel Business Roundtable would like to offer a few key recommendations for congressional action that can help the U.S. regain its dominance in the international travel and tourism market, as well as stimulate the domestic business and leisure travel sectors. A fuller explanation of TBR's position on a wide range of issues is contained in our recently released document, *Travel & Tourism: America's Passport to Success*, which we are sending to all Members of Congress and which can be found on TBR's website, www.tbr.org. For purposes of brevity, we offer in our testimony the top three items that we feel are most pertinent to stimulating travel. We make these suggestions with the recognition that the federal government is experiencing the same types of fiscal restraints that state and local governments and the private sector are also facing. As has been the case since our inception, it is TBR's goal to offer politically and economically feasible solutions. We do not want to overreach or ask for things that are unrealistic or unachievable. However, we hope that you will share our belief that a small investment now will yield multiple returns in the coming years.

Implement and Build Upon U.S. Branding Efforts

TBR applauds the Congress – Senator Ted Stevens in particular – and the President for the unprecedented appropriation of $50 million to the Department of Commerce in fiscal year 2003 for the development of a comprehensive marketing campaign to brand the United States as a destination of choice for international visitors. TBR has been calling for such an initiative for many years, and is working with Commerce Department officials as they lay the groundwork for this undertaking.

It is impossible to stress enough how important international visitors are to the health of our industry as well as the overall U.S. economy. Total arrivals of international travelers to the U.S. registered 41.9 million in 2002 – a 7 percent decline from the 44.9 million foreign visitors in 2001. This is a continuation of a downward trend: in 2000, international arrivals were at an all-time high of 50.9 million. More to the point, the balance of trade surplus generated by travel and tourism has plummeted from $26 billion in 1996 to $8.6 billion in 2001. While countries like France and Spain – currently the most visited countries in the world – spend hundreds of millions of dollars each year to promote themselves to travelers, the U.S. – the third-most visited country in the world – spends nothing and has no comprehensive brand identity.

In 2001, international visitors spent $73 billion in the U.S. – down from a high of $82.3 billion in 2000. It is well known that international visitors spend more than domestic travelers when they travel. For example, New York City is the nation's number-one international visitor destination, and though international travelers comprise only a small portion of the City's visitors, they are responsible for a disproportionately high level of spending. In 2000, though foreign visitors made up only 18 percent of New York City's total visitors, they generated 42 percent of all visitor expenditures. It seems like good business sense – and good policy – to spend some money on promoting what the U.S. can offer to these visitors in an effort to retain and grow this powerful market share. Many countries, including Japan, agree. In the face of a weak economy and SARS, Japan has just committed $19 million for a *Visit Japan* campaign. The Japanese government views their downturn in tourism as both missed revenue and as a national embarrassment.

While TBR is confident that the Commerce Department, in conjunction with the U.S. Travel and Tourism Promotion Advisory Board that is currently being formed, will utilize the $50 million it has been appropriated to develop an outstanding branding campaign for our country, we see this as an important first step to reaching our goals of increasing international visitorship, rather than the end. ***TBR supports a longer-term congressional authorization and funding for branding and marketing the U.S. to continue and build upon the groundwork that this initial undertaking will engender.***

Increase and Restore the Tax Incentives that Spur Business Travel

After international travelers, business travelers are responsible for a significant amount of travel expenditures. However, business travel has been in decline for several years. The most recent figures show that in 2002, U.S. domestic business travel declined 5.5 percent over 2001, and is down nearly 9 percent from 2000. There are many factors contributing to what is likely to be a continued decrease in business travelers. Many companies that instituted travel bans in the wake of September 11 continued to discourage business trips because of economic difficulties. The recent war and concerns about SARS have caused even more companies to place severe limits on the amount of travel that takes place or to ban it altogether. For hotels, airlines, restaurants, car rental agencies and many other segments of the industry – as well as state and local governments – this translates to steep revenue losses as businesses send one representative to a meeting for two days rather than three days, or send two people to a conference rather than three or four people.

The reduction of the business meal and entertainment tax deduction from 100 percent to 50 percent and the elimination of the spousal travel tax deduction negatively affected the restaurant and entertainment industries and the business customers they serve even before September 11, particularly harming small businesses. Research conducted by TBR members in 1998 shows that business meal users and providers span across demographic lines: one-fifth of business meal users are self-employed; more than two-thirds of business meal users have incomes of less than $60,000 and 37 percent have incomes below $40,000; and low to moderately priced table service restaurants – often small businesses themselves – are the most popular providers of business meals, with the average check totaling less than $20. ***TBR encourages Congress to upwardly revise the business meal and entertainment tax deduction and restore the spousal travel tax deduction.*** Doing so would provide an immediate incentive for small businesses and corporations alike to authorize their personnel to start traveling again.

Establish a Presidential Advisory Council on Travel and Tourism

Because travel and tourism policy matters are greatly diffused throughout the federal government, TBR called for the creation of a Presidential Advisory Council on Travel and Tourism in March 2001. More than two years later, the proposal is still under consideration by the Bush Administration. Comprised of presidentially appointed representatives of business, government and non-profit organizations with expertise in policy matters impacting tourism development, the Council would be the ideal body to explore ways that the travel and tourism industry can work for the benefit of our nation. The Council would advise the President on national tourism policies and would help ensure that travel and tourism receives a more sustained and vigorous policy focus at the federal level. It would also help coordinate the activities of the Administration and the many departments and agencies that impact travel and tourism.

While the coordination of travel and tourism policy seemed like a great idea when TBR first proposed the formation of the Council in March 2001, it is now clear that this type of comprehensive partnership among the private sector, Congress and all agencies of the federal government that deal with tourism-related issues is an imperative. More than 130 nations have cabinet-level tourism officials or some form of government-sponsored tourism office. These nations recognize that a coordinated national tourism policy fulfills numerous goals, such as creating jobs, expanding trade surpluses and generating economic vitality on a multi-regional basis within their countries. The absence of an analogous effort within the United States hampers our nation's ability to achieve these important objectives, and is a contributor to the factors that have stymied tourism to and within the U.S. in the last year-and-a-half. The Council would be created by Executive Order under the Federal Advisory Committee Act (FACA). ***TBR requests Congress' support in urging the President to create the Presidential Advisory Council on Travel and Tourism.***

CONCLUSION

The Travel Business Roundtable appreciates the opportunity to provide, for the record, its thoughts and recommendations on the common sense initiatives that will help revitalize an industry that has contributed so much to our country's bottom line. We are also appreciative that the Subcommittee will play our newly released video, which celebrates travel and tourism in the U.S. The video was unveiled on April 9 at a summit that TBR hosted with the U.S. Chamber of Commerce, a TBR member organization. The historic conference, titled *Re-Igniting Growth in Travel and Tourism*, brought together more than 200 CEOs and senior-level executives along with three Cabinet Secretaries, congressional leaders, mayors from cities across the country and senior Administration officials. The event marked a turning point for our industry in many ways, and we believe it represents the beginning of a new and stronger partnership between the federal government and the industry. TBR looks forward to working with the Subcommittee as it examines issues relating to the industry and considers policy initiatives to spur travel and tourism.

TRAVEL BUSINESS ROUNDTABLE

MEMBERSHIP

Jonathan M. Tisch
Chairman, ***Travel Business Roundtable***
Chairman & CEO, ***Loews Hotels***

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Four Seasons Regent Hotels & Resorts
Greater Boston Convention & Visitors Bureau
Greater Fort Lauderdale Convention & Visitors Bureau
Greater Miami Convention & Visitors Bureau
Gucci
The Hertz Corporation
Hilton Hotels Corporation
Hotel Employees and Restaurant Employees International Union
HRW Holdings, LLC
Hyatt Hotels Corporation
Inc Magazine
International Association of Convention and Visitors Bureaus
InterContinental Hotels Group
International Council of Shopping Centers
International Franchise Association
Interstate Hotels & Resorts
Interval International
JetBlue Airways Corporation
Las Vegas Convention & Visitors Authority
Loews Hotels
Los Angeles Convention and Visitors Bureau
Lufthansa Systems North America
Mandalay Resort Group
Manhattan East Suites Hotels
Marriott International Inc.
The Mills Corporation
Nashville Convention and Visitors Bureau
National Basketball Association Entertainment
National Football League
National Hockey League
National Restaurant Association
New York University
Newport County Convention & Visitors Bureau
Northstar Travel Media, LLC
NYC & Company
Omega World Travel
Pegasus Solutions, Inc.
Philadelphia Convention and Visitors Bureau
PricewaterhouseCoopers, LLP
Seattle's Convention & Visitors Bureau
Smith Travel Research
Starwood Hotels & Resorts
Strategic Hotel Capital Inc.
Taubman Centers, Inc.
Tishman Construction Co.
United Airlines
Universal Parks & Resorts
United States Chamber of Commerce
United States Conference of Mayors
USA Today
Vail Resorts, Inc.
Walt Disney Parks and Resorts
Washington D.C. Convention and Tourism Corporation
Waterford Group, LLC
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Short Communication

Roller Coasters, G Forces, and Brain Trauma: On the Wrong Track?

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ABSTRACT

There has been enormous attention in the general press on the possibility that high G force roller coasters are inducing brain injury in riders. Armed with a handful of anecdotal case reports of brain injuries, the U.S. Congress has recently proposed legislation to regulate the level of G forces of roller coasters. However, high G forces are well tolerated during many activities and, therefore, are a poor measure for the risk of brain injury. Rather, accelerations of the head that can be caused by G forces are the key to producing injury. To determine the extent of head accelerations during roller coaster rides, we acquired G force data from three popular high G roller coasters. We used the highest recorded G forces in a simple mathematical model of head rotational acceleration, with the head rigidly pivoting from the base of the skull at a radius representing typical men and women. With this model, we calculated peak head rotational accelerations in three directions. Even for a conservative worst-case scenario, we found that the highest estimated peak head accelerations induced by roller coasters were far below conventional levels that are predicted for head injuries. Accordingly, our findings do not support the contention that current roller coaster rides produce high enough forces to mechanically deform and injure the brain.

Key words: G force; head rotational acceleration; roller coaster; traumatic brain injury

RECENTLY, THERE HAS BEEN MUCH ATTENTION focused on the possibility that larger and faster roller coasters with high G forces (G's) are inducing brain injury in riders. A series of case reports appearing in medical journals have described hemorrhage in the brains of some roller coaster riders (for review, see Braksiek and Roberts, 2002), calling into question whether these injuries could have resulted from the forces experienced during the rides. In the general press, news reports have described the perils of riding high-powered roller coasters, such as stories from the *Los Angeles Times*, "As thrills increase, risks to brain rise" (6/5/01), and the *Washington Post*, "The thrill is . . . Deadly" (5/21/02). Through efforts spearheaded by Representative Edward Markey of Massachusetts, the U.S. Congress is turning its attention to roller coaster safety, and legislation is being proposed to regulate G forces induced by roller coaster rides. However, absent from all of this fanfare is any sound evidence or analysis directly linking roller coasters with brain injury. Here, we examine if roller coasters actually pose a risk and point out a fundamental misunderstanding of how G forces play a role in the biomechanics of brain injury.

Clearly, as new roller coaster designs incorporate greater vertical drops, the G's increase, as do the visceral sensations of the riders. The current upper range of peak

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G forces on the more powerful rides is 4–6 G's, as listed on Rep. Markey's Amusement Park Ride Safety website (www.house.gov/markey/iss_parkrides.htm) and from the Roller Coaster DataBase (www.rcdb.com). However, it is far too simplistic to use the G's alone as a measure for the risk of brain injury. For example, 5–9 G's is thought to be the maximum exposure limit for a human based on the tolerance of fighter pilots exposed to high G's (Whinnery and Whinnery, 1990). Yet, this threshold is for sustained G's over many seconds (mean of 43 sec), which will cause unconsciousness from reduced blood flow to the brain. Roller coasters apply only brief accelerations (<3 sec) in different directions throughout the ride, with little chance of inducing unconsciousness from pooling of the blood in the extremities. Furthermore, high G's of short duration are common and well tolerated in many daily activities, such as hoping off a step or "plopping" into a chair, where 8–10 G's have been measured in volunteers (Allen et al., 1994). Accordingly, G force alone is not a good measure for the risk of brain injury. Rather, *head accelerations* that can be caused by G forces are the key to producing injury (Gennarelli, 1993).

To induce nonimpact brain trauma, several reports have demonstrated the importance of head rotational acceleration caused from loading applied elsewhere on the body (Gennarelli, 1993; Meaney et al., 1995). The indirect loading can occur from the seat belts that restrain an occupant during a motor vehicle crash or, in the case of roller coasters, the acceleration delivered through the seat of the occupant. Brain injury due to rotational acceleration is dependent on very rapid deformations of the brain, typically within a time span of less than 50 msec (Metz et al., 1970). It is now well recognized that rapid head rotational acceleration can initiate several significant brain injuries, including diffuse axonal injury throughout the white matter, and, at very high levels of acceleration, tissue tears and vascular disruption (Adams et al., 1982; Gennarelli et al., 1982; Smith et al., 2000). Recent studies from humans, animal models, physical models, and emerging computational simulations provide guides for the human tolerance to rotational accelerations of the head (Pincemaille et al., 1988; Lowenhielm, 1974; Margulies and Thibault, 1992; Zhang et al., 2001; Meaney et al., 1995; Gennarelli et al., 1982; Smith et al., 2000). Although each roller coaster will expose its riders to unique G profiles and, in turn, unique head rotational accelerations, it is possible to approximate the rotational accelerations and place the loading in the context of known criteria for traumatic brain injury. Three basic features of G forces experienced by riders contribute to the resulting head acceleration: (a) the acceleration magnitude, (b) the principal acceleration direction, and (c) the time interval over which each significant acceleration occurs. It is necessary to account for all these features in order to truly understand how different environments can pose risks to humans.

To estimate noncontact head accelerations induced from roller coasters, we acquired G-force data from "high G" rides at three parks: (1) "Rock 'n' Roller Coaster" at the Disney-MGM Studios in Lake Buena Vista, FL, (2) "Speed—The Ride" at the Nascar Café, Sahara Hotel in Las Vegas, NV, and (3) "Face-Off" at Kings Island, OH. We used this data in a mathematical model to determine a worst-case scenario of head accelerations. Analysis of the temporal G force data during the course of the rides revealed that the accelerations in a roller coaster vary from side-to side, fore-to-aft, and in the up-down direction throughout the ride. Typically, the accelerations experienced along the up/down direction are higher than accelerations applied in the fore/aft and side-to-side direction. During different segments of the ride, the relative contribution of each acceleration component can change. Moreover, the time over which these accelerations are applied can vary considerably. As a first approach, we related G forces at the seat level to head accelerations of the occupant. For the worst-case condition from measured data, we used the maximum peak acceleration over the shortest duration. We approximated the head as pivoting stiffly about the base of the skull with the acceleration at the seat transferred directly to the junction between the head and the neck. Over the range of neck and head sizes (5th to 95th percentile) that correspond to the male and female population, we estimated the head rotational accelerations ($\ddot{\theta}$) that occur during the ride:

$$\ddot{\theta}_{\text{peak}} = \frac{a(t)}{r}$$

where $a(t)$ is the acceleration at the base of the skull and r is the radius (female, 10.56–11.33 cm; male, 11.15–11.63 cm), from the head center of gravity to the pivot point. For the maximum side-to-side (coronal plane) acceleration during the rides with maximum G's of 1.2–4.2, head rotational accelerations are 111–387 rad/sec^2. Similarly, for the fore/aft (sagittal plane) accelerations measured in the rides with maximum G's of 1.65–5.4, the most significant estimated head rotational acceleration was 139–502 rad/sec^2. In the vertical direction towards the seat, peak high G's of greater than 5 were produced. However, vertical accelerations are transmitted along the axis of the spine and would induce only modest head rotational accelerations. It is important to note that our calculated rotational accelerations are highly conservative estimates. Actual head accelerations of human riders are likely to be lower than peak estimates due to dissipation of the G's through the body and by cervical spine articulation.

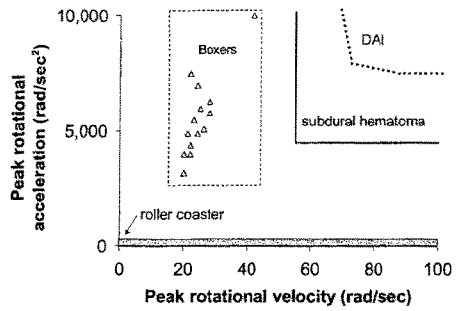

FIG. 1. Relative comparison of the predicted head accelerations experienced by roller coaster riders to thresholds proposed for brain injury. Thresholds depend on the magnitude and duration of applied acceleration. Therefore, criteria are defined using peak rotational acceleration and peak rotational velocity limits. Thresholds have been proposed separately for subdural hematoma from the tearing of parasagittal bridging veins and diffuse axonal injury (DAI). The significant head accelerations experienced by human volunteers in a three-round boxing match are also shown (symbols). None of the volunteer boxers experienced any signs of injury. The maximum predicted head accelerations of roller coaster riders (gray shaded region) are well below the proposed tolerance limits, as well as the measured safe accelerations in the volunteers.

Even for a conservative worst-case scenario, we found that the estimated head rotational accelerations experienced by roller coaster riders are nowhere near the range of established injury thresholds for severe forms of brain injury. For tearing of parasagittal bridging veins that can cause subdural bleeding, a minimum head rotational acceleration of 4,500 rad/sec^2 has been determined for human subjects (Lowenhielm 1974), which is over nine times our highest predicted accelerations during roller coaster rides. Using an alternative analysis of the kinematics of brain tissue deformation during head rotational acceleration, the threshold for diffuse axonal injury in the white matter was determined as 9,000 rad/sec^2 (Margulies and Thibault, 1992), 18 times higher than the highest predicted maximum we calculated for roller coaster riders (Fig. 1). Recent studies measuring the head accelerations experienced by human volunteers in a three-round amateur boxing match (Pincemaille et al., 1988) are also well above the predicted head accelerations during roller coaster kinematics (Fig. 1). None of the boxers showed any signs of significant brain injury or even concussive-type symptoms.

It should be noted that the thresholds we have cited for brain injury apply to normal, healthy individuals. Although some case reports have described rupture of preexisting vascular malformations in the brains of roller coaster riders (Braksiek and Roberts, 2002), it is unknown whether these individuals had a reduced tolerance to head accelerations. However, it is well recognized that hemorrhage from vascular malformations can occur during many activities that do not mechanically deform the brain. Factors other than head accelerations should also be considered in these cases, such as hypertension from the excitement of the ride.

In the general press, there seems to be confusion between increased reporting of brain injuries following roller coaster rides and an actual increased incidence. To our knowledge, no peer-reviewed studies have found a risk of brain injury by riding newer, more powerful roller coasters, let alone measuring the possible increase risk factors that could occur with preexisting vascular malformations. While waiting for this issue to resolve, we highly recommend that all roller coaster riders use a proven method to reduce the risk of brain injury: make sure your seatbelts are buckled at all times when driving to an amusement park.

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Fixed Theme Park Rides and Neurological Injuries

EXPERT PANEL CONSENSUS REPORT

REVISED AUGUST 9, 2002

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American Association of Neurological Surgeons

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I. Background

A significant amount of recent attention has been focused on whether fixed theme park rides pose a risk of potential neurological injury to riders. While there are many opinions as to whether a problem exists, what has been lacking is a systematic and comprehensive approach to understanding the current level of evidence and which conclusions can be reasonably drawn from that evidence. An expert panel was convened with a broad mandate to evaluate the current level of medical evidence in this area with a specific focus on the issue of causality, degree of health risk and potential areas for additional research or surveillance. The panel was organized by Neuro-Knowledge™, a program of the American Association of Neurological Surgeons (AANS) and Outcome Sciences, Inc. (Outcome Sciences). The program was underwritten by Six Flags Theme Parks, Inc. (Six Flags). The AANS is the largest organization of neurosurgeons in the United States. Outcome Sciences is a web-based health care research company. The panel was fully independent of the sponsor and was not restricted in its avenues of inquiry. It was expected that the panel would publish its findings as this White Paper.

A. Industry Overview

In 2002, there will be between 320 - 350 million estimated visitors to fixed theme parks in the United States and those fixed theme parks will deliver several billion rides of all types to those visitors. The term "fixed" refers to parks that are permanently situated at one physical location.

Six Flags, the largest owner and operator of roller coasters, has 39 parks in seven countries around the world and operates 186 roller coasters. Fixed theme park rides are manufactured by a limited number of manufacturers worldwide, including Bollingfer and Mabillard (Switzerland), Intamin (Germany, US), Arrow (US), Chance-Morgan (US), Vekoma (Holland), Premier Rides (US) and Schwartzkopf (Germany-inactive).

Central to the experience of riding a roller coaster are the turns, twists, drops and loops that generate planned and controlled changes in acceleration on the rider. The industry tests and classifies these rides in the same manner as the aeronautical industry evaluates its equipment and pilots with human and dummy test rides and simulations.

Historically, roller coaster manufacturers have developed and extensively tested their systems to function within certain parameters of force. The interest in establishing standards has grown during the last few years. For example, the Rheinisch-Westfalischer Technischer Uberwachungs-Verein (TuV) in Germany, which provides a full range of testing and certification services for over 100 industries, has published one such standard for designing and developing roller coasters. The TuV standard establishes guidelines for acceleration based on maximum head angle versus torso. The European Committee for Standardization (CEN) is close to adopting standards based on these TuV standards as its own. In the US, ASTM International is also developing guidelines consistent with TuV and CEN.

B. Data Sources

A series of data sources were presented to or reviewed by the panel. These included data on fixed theme park accelerations presented by Six Flags, injury statistics of the Consumer Product Safety Commission (CPSC), medical literature on physiology of acceleration, background literature on the types of neurological events under review, and the world's published literature on reported cases of neurological injuries in association with fixed theme park rides.

1. *Six Flags Test Data*

Part of the recent controversy over fixed theme park rides stems from a perception that the G-forces associated with

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these rides have steadily increased as ride manufacturers have sought to increase the "thrill" of the ride. While it is true that roller coaster have become progressively taller (maximal vertical height) and faster (maximal speed) over the past 20-30 years (made possible by improvements in structural engineering), it is a common misconception that these factors necessarily correlate with changes in acceleration (i.e. G-forces). Six Flags has evaluated its own park data for acceleration during the last 6 years on 128 roller coasters (91 steel, 37 wood) introduced over a span of more than 30 years. This data was reviewed by the panel for inclusion in this white paper and is presented in Exhibits 1-5. This represents one of the only reports of actual maximum ride acceleration for a large number of rides actually in use in the United States. As shown in the exhibits, maximum vertical acceleration (spine in compression) and maximum lateral acceleration (side to side) were measured on 128 of Six Flags' roller coasters and catalogued by the year the ride was introduced. This data set reportedly represents 96% of all Six Flags' roller coasters in North America, either by direct inclusion or because of rides duplication between parks. The six roller coasters not included in the data have not been tested due to lack of dynamic significance or are still undergoing testing at the time of this report. Based on the data presented, since the 1970s, these accelerations have remained essentially constant in both vertical and lateral axes despite the clearly increasing maximal speeds shown in Exhibit 3. Exhibits 4 and 5 focus on these same 128 rides versus the proposed ASTM standards. While looping or corkscrew type turns cause a rider in a roller coaster to experience a minimum of 3 to 4 Gs vertical acceleration, it is the duration of time at high levels of G-forces that are particularly of concern as demonstrated by the proposed standards. Using the worst-case combination of acceleration and duration for each ride compared to the proposed ASTM standards, only one ride (which is not currently in operation) of 128 may exceed the proposed standards in the vertical acceleration plane and none exceeded standards in the lateral plane. The duration of time spent in excess of 4Gs is shown to be minimal (Exhibits 4 and 5) with vertical acceleration generally under 2 seconds and lateral acceleration generally under 1 second.

In view of the large number of rides represented by the Six Flags data (approximately 148 out of 643[a] rides in North America, or 23 percent), and, the limited number of manufacturers of roller coasters worldwide, it is likely that roller coasters in other fixed theme parks would have similar acceleration characteristics. In other words, the Six Flags test data is considered a reasonable proxy for the fixed theme park industry.

2. *CONSUMER PRODUCT SAFETY COMMISSION (CPSC) DATA*

The United States Consumer Product Safety Commission's *Amusement Ride Related Injuries and Deaths in the United States: 1987-2000 Report* provides data on fatalities and hospital emergency room treated injuries associated with amusement rides and inflatable attractions.[1] Fatality data is provided from 1987-2000 and injury data from 1993-2000. Data for hazard scenarios are provided by in-depth investigations from January 1,1990 - June 21, 2001. While CPSC has jurisdiction over rides in mobile but not fixed-site amusement parks, it receives and reports on data from both venues. The reporting system excludes occupational accidents.

Data on non-occupational amusement park rides are collected from the National Electronic Injury Surveillance System (NEISS).[2] NEISS is a stratified reporting sample of 100 out of 5,300+ U.S. hospitals (with emergency rooms and with greater than or equal tosix beds) that has been in operation for nearly 30 years. The sample is designed to be representative of all hospitals in the United States. The primary purpose of NEISS has been to provide timely injury and fatality data on 15,000 types of consumer products under CPSC's jurisdiction. Periodically updated to reflect the universe of U.S. hospitals, the NEISS sample of hospitals was last updated in 1997 to reflect demographic changes since its previous update in 1990. The NEISS product code for amusement park rides (1293) is used by hospital coders to reflect all incidents associated with amusement park rides. Rides are further classified into one of five mutually exclusive categories including whether the ride was at a fixed or mobile theme park. As the distribution of NEISS hospitals has been established to broadly sample injuries from a large number of products, as a result of this approach, a large number of amusement-site related injury cases in the NEISS data appear to be from fewer than a handful of hospitals in the U.S. (concentrated in the northeast) and then extrapolated to generate estimates for the entire nation. Consequently, the numbers of accidents included in the NEISS database are unlikely to represent the actual incidence of accidents across the nation.

Based on this hospital reporting sample, the most recent CPSC report extrapolates to estimate over 10,000 emergency room treated injuries (all types) associated with both mobile and fixed site amusement rides in year 2000. It is estimated that fixed site rides accounted for 6,590 of the total injuries in 2000. The CPSC has reported that from 1993 through 2000, there was a "statistically significant" increase in the number of fixed site injuries but qualified this to state that this constituted only a "marginally significant" increase when adjusted for the increase in park attendance. These figures include all types of injuries, all causes and all body parts. From 1987 - 1999, fatalities averaged 4.5 per year. Most injuries occurred in children age 10-14 (17.9%), while children age 5-9 (12.6%),

[a] Data on total number of roller coasters in North America from www.rcdb.com/census/htm. 2002.

and 15-19 (13.8%) were the next most frequent. Females were injured at a rate of 1.5 times more frequently than males (60 percent vs. 39 percent) and this held true across ride sites, age groups, injured body part, and diagnosis.

3. *Exposure Corrected Risk Estimates for Childhood Product Related Injuries*

Absolute injury rates in a setting of millions or billions of exposures are difficult to assess for actual risk. One group has used an age-associated risk model to better understand the childhood age-associated risk for amusement park rides and their correlation to NEISS.[3] This study assessed the effect of exposure correction on injury risk estimates for children, using Chicago-area survey data on age-specific exposure of children to seven products including amusement park rides. NEISS data estimates for 1987 were used as numerators with two denominators: uncorrected age-specific U.S. Census estimates for 1987 and these estimates corrected for exposure. For amusement rides (all types), corrected injury rate decreased as a child's age increased. Among the product groups, corrected injury rate/100,000 exposed children was lower for amusement rides than for bunk beds, skateboards, sleds, non-powder firearms, and fireworks. Amusement rides had the lowest adjusted rates versus all of these common activities in nearly all age and sex categories. For example, 1987 consumer-product injuries corrected per 100,000 exposed children demonstrated amusement rides in males between the ages of 10 and 14 accounted for 10 injuries per 100,000 exposed compared to 67 per 100,000 for bunk beds, 1311 per 100,000 for skateboards and 573 per 100,000 for sleds.

4. *Acceleration (G-force) and Roller Coaster Physiology Data*

There is limited literature on the actual physiological effects of roller coasters although much is inferred from the aeronautical literature on acceleration.[4-9] The most highly controlled physiological studies are either centrifuge experiments or airplane maneuvers mimicking roller coaster activity. One unique study on an actual roller coaster demonstrated a sudden and sustained increase in heart rate with corresponding increases in myocardial oxygen consumption.[6] In this study by Pringle et. al., 13 subjects (7 women and 6 men) with a mean age of 28 (range 19 -36) and without cardiovascular disease underwent ambulatory electrocardiography (ECG) while on a roller coaster ride.[6] The roller coaster had a double loop corkscrew and imparted an acceleration force of 3 Gs and reached a speed of 64 km/hr during forward and reverse runs. The ride lasted 94 seconds. Of the subjects, 12 had good quality ECGs recorded. No subject demonstrated either ischemia or ventricular arrhythmia. The mean heart rate increased from 69.8 to 154.2 beats per minute pre and post-ride. All subjects reached their maximal heart rate in 8 seconds and the mean time to return to normal was 8.9 minutes (range 2-40).

In contrast to the limited case of roller coasters, physiologic effects of G-forces have been well studied in the aeronautical literature. The measurement of acceleration is often done in units of G where 1 G is the acceleration experienced by a free falling object near the surface of the earth or 9.81 m/sec^2 or 32.2 ft/sec.^{2} Numerous cardiovascular symptoms have been noted under G stress, including blackout, loss of consciousness, and amnesia.[4] G-induced loss of consciousness (G-LOC) alters the perception and awareness of reality from a sudden critical reduction of cerebral blood flow. Incapacitation may last 15 seconds and many individuals do not remember losing consciousness. G-LOC is dependent upon both G-force and its duration and this occurs in a predictable manner. Based upon test results in pilots, G-LOC occurs largely from G-forces in the Z vector. Changing vectors are less well studied.[5] Although G-forces have been extensively studied in centrifuge and airplane tests, an exhaustive review of this literature failed to reveal any description of the types of neurological injuries (carotid and vertebral artery dissections, intracranial hemorrhage, cerebrospinal fluid leak, etc.) described in the world's medical literature as having been noted in the acceleration testing literature.

It should be noted that the human body encounters significant G-forces during activities of daily living. Sneezing and coughing can generate forces in excess of 20 Gs, albeit for very short durations, while a child spinning on a tire swing can generate a negative acceleration of 3 Gs for 30 seconds. Data on similar activities of daily living and the experienced G-forces were presented to the panel (see Exhibit 6).

C. Types of Neurological Injuries That Have Been Associated with Rides

The specific area of focus for the panel was to examine the types of injuries that might occur following a normal ride. It was accepted that a major collision or fall from great heights could cause severe head trauma and these types of injuries were excluded from discussion. Injuries due to ride malfunction or inappropriate rider behavior were excluded with the assumption that the nature and cause of these injuries were usually clear. The panel was interested in the occurrence of injuries without ride malfunction or inappropriate rider behavior. The types of neurological injuries that have been reported in the world's literature in association with a normally functioning fixed theme park rides are few but quite varied. These injury types include carotid and vertebral artery dissection, intracerebral hemorrhage subdural hematoma and spontaneous cerebrospinal fluid leaks. In order to evaluate potential mechanisms of fixed theme park induced injury, it is important to understand both the known mechanism of cause for these injuries and the background incidence rates with which these events can occur without precipitating cause in the general population.[7-13] This section provides a brief

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overview of the literature on the early warning signs and clinical symptoms of these conditions.

Cerebral vascular dissections, including spontaneous and trauma-induced vertebral artery dissection (VAD) and internal carotid artery dissection (ICAD), are extremely rare and have been associated with several pre-disposing factors. The annual incidence rate of VADs and ICADs are 1-2.5 per 100,000 and 2.5-3 per 100,000 respectively. The majority of these dissections occur as idiopathic or spontaneous events. Typical patients are young to middle aged. [14]

The extracranial segments of the carotid and vertebral arteries are at greater dissection risk than the intracranial segments. Intramural hematoma is reported to develop following intimal tears, which allow blood under arterial pressure to enter the vessel wall. Genetic and environmental factors may play a role in the pathogenesis of spontaneous dissection of the carotid or vertebral arteries. Genetic factors may include underlying structural defects, Ehlers-Danlos syndrome, Marfan's syndrome, autosomal dominant polycystic kidney disease, and osteogenesis imperfecta type I. It is believed that patients at risk of dissection probably have an inborn defect of the collagen or elastic tissue that makes the artery more susceptible to injury. Relatively minor precipitating events associated with hyperextension or rotation of the neck (e.g. coughing, yoga, sneezing, manipulation), as well as major trauma from falls or motor vehicle accidents, may be the final insult to trigger the dissection or the ischemia associated with the dissection. There are reports of arterial dissection associated with a history of migraine headaches and with certain seasonal patterns. [14,16-23]

The clinical presentation of ICAD and VAD (local and ischemic manifestations) has been described. Internal carotid artery dissection may present with a classic triad of pain on one side of the head, face or neck, partial Horner's syndrome and cerebral or retinal ischemia several days later. The presentation of VAD is usually less distinct and includes presentation with pain in the back of the neck or head, which is coincident with the development of the VAD. Headache is the most common presenting symptom for both events (ICAD (68%) and VAD (69%-80%)). Dissections of the carotid and vertebral arteries are a well-recognized cause of stroke. Identification of risk factors and warning symptoms associated with arterial dissection may allow early intervention and decrease morbidity, but this remains a difficult clinical task.[14,18] A history of migraine headache has been identified as an additional risk factor for the development of VAD in adults and in at least one pediatric case report.[19] Both vertebral artery and internal carotid artery dissection are known to occur without any known inciting event or following minor trauma.

Spontaneous or idiopathic intracerebral hemorrhage occur with an incidence between 10 to 20 cases per 100,000 and is associated with increasing age.[20] In the United States, as many as 50,000 individuals may suffer from an intracerebral hemorrhage each year. Subarachnoid hemorrhage is estimated as 5 to 8 cases per 100,000 and is associated with cigarette smoking and possibly hypertension.[21]

Cerebrospinal fluid leaks, of which there is a single report of occurrence in association with a fixed theme park ride, also occur spontaneously. One such report describes eleven patients who presented with postural headache, neck stiffness and tenderness without a known precipitating event. These cases are thought to be secondary to an underlying connective tissue abnormality.[24]

In summary, review of the medical literature suggests that nearly all of the neurological injuries reported in association with fixed theme park rides (and described in the section that follows) also occur without any known precipitating cause or following minor trauma or routine neck movements and during everyday activities.

D. Review of Published Literature on Fixed Theme Park Rides and Neurological Injuries

The world's published literature on neurological injuries reported in association with fixed theme park rides was provided to the expert panel for their review.[7-12,33-44] Additionally, a recent review article on amusement park injuries and deaths was critically examined.[45]

Twenty cases of neurological injuries or sequelae attributed to riding on a fixed theme park ride were identified in the literature review. These twenty cases are presented below by country of incidence. The cases are summarized in Table I and reviewed in detail in the section entitled Critical Review of Case Reports.

United States:
In the United States, eight cases associating fixed theme park rides with neurological events were found in the published literature. These cases consisted of two subdural hematomas, one internal carotid artery dissection, one subarachnoid hemorrhage, one cerebrospinal fluid leak, one patient with Brown-Sequard syndrome, one vertebral artery dissection and one case of migraine headache.

Canada:
Canada had two cases associating fixed theme park rides with neurological injuries reported in the medical literature. Both cases were patients presenting with subdural hematomas.

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France:
Seven cases associating fixed theme park rides with neurological injuries are reported in the medical literature from France. These included four cases of internal carotid artery dissection, two vertebral artery dissections and one case of cervical syringomyelia.

Italy:
Italy contributed one case to the literature associating fixed theme park rides with neurological events. This case involved a patient with a subarachnoid hemorrhage.

Japan:
Japan contributed one case to the literature associating fixed theme park rides with neurological events, a subdural hematoma.

United Kingdom:
The United Kingdom provided one case to the literature associating fixed theme park rides with neurological events. This was a vertebral artery dissection.

E. National Survey of Neurosurgeons

In view of the lack of primary data sources, a national survey of representative U.S. neurosurgeons was planned and conducted prior to the meeting of the expert panel in order to provide additional data for evaluation. This data was presented in preliminary format to the panel. The survey was conducted among U.S. members of the American Association of Neurological Surgeons (AANS). The survey questions included items regarding practice demographics, distance to the nearest fixed theme park, type and frequencies of neurological injuries treated in each practice and possible association of the injuries to the fixed theme park rides. A total of 282 neurosurgeons, representative of 7.2% of all practicing neurosurgeons in the United States responded to the survey.[46]

II. Methods

A. Selection of Expert Panel Members

Expert panel members were selected based on their areas of expertise, national recognition, and broad-based experience relative to the subject matter. They included thought leaders in neurosurgery, neurology, biomedical engineering, biostatistics, epidemiology, emergency medicine, and general medicine.

B. Selection of Medical Literature

A MEDLINE search (1966 - April 2002) was performed by an experienced medical librarian to obtain key articles related to vertebral and carotid artery injuries, intracranial hemorrhage, spontaneous spinal cerebrospinal fluid leaks, cervical manipulation associated with arterial dissections and stroke, physiology of acceleration, and injury statistics associated with fixed theme park rides. The search was limited to human subjects, but not to the English language. Review articles were included in the search.

C. CPSC Data

The United States Consumer Product Safety Commission's *Amusement Ride Related Injuries and Deaths in the United States: 1987-2000 Report* and *The Consumer Product Safety Commission National Injury Surveillance System (NEISS) CPSC Document #3002* were evaluated for their relevance to head injuries and to understand how United States national data is collected.[1,2] An internet site detailing geographical location and cause of U.S. roller coaster fatalities from 1972-1997 was also reviewed.[47]

D. Case Reports

A MEDLINE search (1966 - April, 2002) was performed by an experienced medical librarian to identify reported cases of roller coaster associated neurological injuries. The search was limited to human subjects but not to the English language.

E. National Survey of Neurosurgeons

A national survey of representative U.S. neurosurgeons as identified by membership in the American Association of Neurological Surgeons (AANS) was undertaken by Neuro-Knowledge.™[46] This information was presented to the panel. The objectives of the survey were: 1) To estimate the incidence rate in the United States of neurological injuries considered to have no inciting event (idiopathic) and those reported in association with a fixed theme park ride; and 2) to estimate the incidence rate by type of injury. This included both overall injury rates and rates for normal functioning rides with appropriate rider behavior.

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The study design was as follows: The survey included questions regarding practice demographics, distance to the nearest fixed theme park, type and frequencies of neurological injuries treated in each practice and possible association of the injuries to fixed theme park rides. The survey was placed on a secure web site and an electronic message with an access code was sent to a total of 464 neurosurgeons representing about 11.8% of neurosurgeons in the United States. The participating neurosurgeons responded electronically and the data was transferred to a database that was used for analyses. Participants were compensated a nominal fee for completing the survey. A total of 282 neurosurgeons representing 7.2% of all neurosurgeons in the United States responded to the survey.

F. Evaluating Strength of Evidence and Causality

The panel adopted well-established criteria for evaluating the overall strength of evidence relating neurological injuries to fixed theme park rides. In using this approach, which is commonly cited for the development of evidence based guidelines of care; the literature is initially considered on the strength of basic methods. In this construct, randomized clinical trials (RCT) provide the highest level of evidence followed successively by cohort studies, case-control studies, and case series. Case series alone are considered the weakest level of evidence. The Bradford-Hill criteria were chosen as the framework under which the panel would attempt to evaluate the evidence for causation.[48,49] The panel considered several measures of effect including incidence rate defined as the number of injuries divided by the total duration of rides; absolute risk or incidence rate difference defined as the injury rate among riders divided by rate among non-riders; relative risk or incidence rate ratio; and attributable risk defined as the absolute risk divided by the incidence rate. To address the question "Do fixed theme park rides cause neurological injury?" the panel used several criteria in an attempt to assign causality. They included:

- Strength of association (Is the incidence of head injuries substantially greater among fixed theme park riders compared to non-riders?)
- Consistency of association (Do similar fixed theme park rides appear to cause similar neurological injuries?)
- Temporal relationship (Did the injury occur during or within a reasonable time period after the ride?)
- Dose response effect (Are a greater number of rides or more aggressive rides associated with greater injury?)
- Biological plausibility (Do features of fixed theme park rides such as high G-forces of short duration plausibly explain specific injuries such as intracranial hemorrhage?)

III. Deliberations: Review of the Evidence

The panel divided its discussion of relevant evidence into two categories. First, a summation of all cited data sources, including a critical review of the existing medical literature was undertaken. The goals were to use common criteria to determine the strengths and weaknesses of the current body of knowledge. Second, the panel agreed in advance that it would examine whether a causal association could be clearly determined by applying a commonly cited framework, the Bradford-Hill criteria. Following this review, the panel undertook to evaluate potential ways to address perceived deficiencies in the knowledge base.

A. Review of Data Sources

1. *CPSC and NEISS data*

The CPSC collects data in a variety of ways including NEISS data, death certificates provided by medical examiners, in-depth investigations of other reports. It includes both voluntarily reported theme park data (fixed theme parks are excluded from certain federal reporting requirements) and mandatory reporting data from several states, including some with large, high volume theme parks (*e.g.* New Jersey). There were several issues with the CPSC reports and the underlying NEISS data addressed by the panel. The most substantive

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finding in review of the actual case descriptions was the complete lack of identification of the types of neurological injuries being reviewed by the panel (occurring in a normally functioning ride) in the last 12 years of the NEISS data set. This represents the only statistical sample available in the CPSC data set. As a result, it appears that the neurological injury cases under review by the panel have not been detected by the NEISS system. In other words, the panel felt that the NEISS data was not useful or relevant to the question at hand. Some specific additional comments on these data sources were made.

With regard to the NEISS data, the panel felt that the NEISS hospitals represent a statistical sampling strategy designed to collect data on common events with common products. The panel felt it unlikely that the NEISS data would have been designed for products that might have variable geographic distributions, such as fixed theme parks or skiing facilities. As such, its sampling strategy has most likely not been validated for this category of product injuries and should be prior to using such data for the types of extrapolations being performed. For example, it appears from review of the data that most of the amusement park injuries extrapolated to national estimates by the CPSC come from an extremely low number of hospitals that are actually near a fixed theme park. As a result, small numbers can significantly skew results.

Other problems with the NEISS data set included the case ascertainment strategy. One panelist was from an emergency department in a NEISS reporting hospital and noted that the abstraction of data for the NEISS report is never performed by the treating clinician in that institution and therefore subject to significant potential for misclassification errors. Furthermore, the amusement park ride product code (1293) was felt to be too general and as a result included both minor injuries and potentially non-ride related injuries.

The panel was also concerned with the face validity of the data set. For example, in one subset of reviewed CPSC data, 3600 head injuries are reported with only 115 hospitalizations. Furthermore, 1900 concussions were reported without a single hospital admission (the one hospital that had an admission had a zero statistical weighting). The clinical experts on the panel felt that these data points were inconsistent with known practice standards (*e.g.* hospitalization rates for patients with concussions). These issues further emphasized the potential for data quality issues with the reported information. More accurate abstraction (ideally by a treating clinician), more specific product codes, and separation of severe from minor injuries (*e.g.* 17% of the reported head injuries are contusions or bruises), would all be helpful in improving the overall quality of the data sample for amusement park injuries. However, even with such changes, the panel felt that the CPSC dataset still would not be likely to capture the data needed to evaluate the types of rare neurological injuries being reviewed by the panel.

The panel concluded that while the CPSC does capture an occasional neurological event through death certificates (2 in 12 years) or in-depth investigation (2 in 12 years), for the purpose of statistical sampling, it relies on the NEISS data set. However, the NEISS data were not designed to capture the types of neurological injuries under review with statistical validity. This was clear by the lack of these specific events in the NEISS data that was used by the CPSC in its report. While the CPSC data is probably useful for well distributed, and clearly identified product categories (*e.g.* toasters), it is not designed for determining incidence rates for these exceedingly rare and difficult to identify events. For the types of neurological injuries described in association with fixed theme park rides, the panel felt that the NEISS data is not relevant. More strongly, the panel felt that using the CPSC data to describe neurological injuries that it does not systematically capture in its statistical sample is misleading.

After reviewing multiple data sources, the panel determined that the available data sources were inadequate to provide the necessary data for determining incidence and risk, namely the type of ride, the number of risk episodes associated with each ride, the number of risk episodes at each park and the number of events of each type in question as related to both the ride and the park.

2. *Critical Review of the Case Reports*

The panel reviewed each of the reported cases from the world's medical literature in detail. In some cases, reports constituted no more than a letter to the editor. One goal of this case-by-case review was to carefully examine the types of cases being reported and to determine if any patterns in the cases might implicate a particular mechanism of injury. Another goal was to identify any cases that might fail to meet a minimal level of plausibility for the ride being implicated as associated with the injury. In other words, if in the consensus view of the panel, the described injury was felt to be clearly unrelated to the ride based on the medical facts, then such a case was labeled as implausible. If the association was felt to be more probable than not, it was labeled plausible. If insufficient data was provided to make a determination regarding plausibility, the case was labeled as such.

CASE 1:

The first case was self reported by a 66 year-old male neurosurgeon who was anticoagulated with a prothrombin time between 20 and 30 percent of normal.[33] During a roller coaster ride, the patient described a dull thud in the right frontal region. Over the following week he experienced occasional right-sided frontal headaches. He was stable until 3 weeks after the ride when he began to gradually develop

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other symptoms including light flashes, difficulties with sequential thought, speech and function of his right hand. Approximately 6 weeks after the ride, a craniotomy was performed and a left-sided subdural hematoma was evacuated. The patient made a complete recovery.

COMMENT: This case involved a 66 year-old male with a potential risk factor, anticoagulation, who could be considered a trained observer (a neurosurgeon). The patient noted a specific time when a "thud" occurred in his head during the ride. Symptoms developed approximately 5 days later although the patient did not present to medical attention for 6 weeks. The patient was ultimately diagnosed and treated for a subdural hematoma. This case was deemed to be plausible.

CASE 2:

A previously healthy 13 year-old female experienced a stroke in association with riding a roller coaster in which she was turned upside down while supported by a padded metal shoulder support resembling a horse collar.[7] After stepping off of a roller coaster, the patient noticed difficulty speaking that spontaneously cleared within one hour and a headache that persisted. Two days later, she awakened with a right-sided hemiparesis and expressive aphasia and was subsequently admitted to the hospital. Carotid angiography revealed a left internal carotid artery dissection. The patient was anticoagulated with intravenous heparin and her aphasia and right hemiparesis cleared. At the time of her discharge, approximately 11 days after her roller coaster ride, her speech was fluent but with occasional word blocking. The authors' hypothesized that because of her small size during the twisting portion of the ride, the patient was forced against the harness and suffered trauma to the left carotid artery with the formation of an intimal thrombus that subsequently embolized and occluded the internal carotid artery distal to the carotid siphon.

COMMENT: This case reports a previously healthy 13 year-old female who experienced an internal carotid artery dissection in association with a roller coaster ride. In this case, the patient developed dysphasia immediately after stepping off of the roller coaster, although these symptoms initially cleared. The panel believed that the injury could have occurred during the ride and deemed this case to be plausible.

CASE 3:

A previously healthy 32 year-old woman experienced sudden onset of severe headache during a looping portion of her fifth roller coaster ride of the day. She was drowsy and confused after the ride and complained of severe headache.[8] She was diagnosed with a subarachnoid hemorrhage secondary to a left distal cerebral artery aneurysm. The patient made a satisfactory recovery after surgery to obliterate the aneurysm.

COMMENT: The authors of this report claimed that the aneurysm was likely to have been caused by the rides. In contrast to this, the panel felt it highly unlikely that the ride could have precipitated development of an aneurysm. More probable, the patient had a pre-existing aneurysm that might have bled during or after a ride. The panel felt that in this case the association of the actual hemorrhage to the ride was plausible. It was also noted that the aneurysm might have ruptured without the ride.

CASE 4:

A 39 year-old woman developed a headache due to a cerebrospinal fluid leak associated with a roller coaster ride.[34] After riding a roller coaster at an amusement park, the patient experienced upper back discomfort. The next morning, the patient described a severe headache, nausea, and photophobia. Her headaches were exacerbated by standing and relieved by lying down and persisted for several months. Myelography eventually demonstrated a thoracic cerebrospinal fluid (CSF) leak.

COMMENT: Although the literature reports the spontaneous occurrence of such events, it may have occurred at the time of the roller coaster ride and therefore the association was thought to be plausible. Most cases of CSF leak are believed to occur secondary to a predisposing connective tissue weakness and that may have been the case for this patient as well.

CASE 5:

A 77 year-old retired orthopedic surgeon on systemic anticoagulation for atrial fibrillation and a history of myocardial infarction described a "rough ride" on a roller coaster during which he bumped his head. Subsequent to the roller coaster ride, the patient noted nausea after a ride on another amusement. Five days later, the patient developed persistent nausea, vomiting, disorientation, headache, and dysarthria leading to obtundation. He was found to have subdural and intracerebral hematoma. He was anticoagulated above target range with an INR of 4.2. Despite normalization of his bleeding parameters within 12 hours and evacuation of the hematomas, the patient continued to decline neurologically and died 13 days after his roller coaster ride.

COMMENT: This case involved a 77 year-old individual with multiple predisposing factors that placed him at risk for a subdural hematoma (anticoagulation, age). He was in the high range for anticoagulation from warfarin therapy and specifically cited an inciting trauma ("bumped his head on ride"). This case was considered to be plausible. The panel noted, however, that the same patient might easily have developed a similar bleed by bumping his head without being on a roller coaster or with no identifiable trauma at all.

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CASE 6:
A 37 year-old female developed Brown-Sequard syndrome associated with a roller coaster ride at a theme park.[36] The day after visiting a theme park, the patient complained of a sore neck particularly when she extended, flexed, or rotated it. Two days later, she again rode a roller coaster and her neck pain continued to increase in intensity. Over the next five days, her neck became stiff. Within a month after the first amusement park ride, she developed altered temperature sensation over the right side of her body. A left partial Brown-Sequard syndrome with mild weakness affecting the left arm and leg and right-sided sensory weakness to C5 was noted. Shortly thereafter, the patient developed severe weakness of her left arm and leg and was admitted to the hospital. An MRI scan showed severe cord compression at C2-C3. At operation, an intradural cystic lesion with mucinous contents was found in front of the spinal cord consistent with a pre-existing enterogenous cyst. The patient's recovery was uncomplicated with mild residual weakness.

COMMENT: This patient developed a Brown Sequard syndrome 5 days after her roller coaster ride and a subsequent airplane flight. The panel concluded that the overall problem was caused by a congenital defect, and the temporal relationship between the ride and the onset of neurological symptoms was unconvincing. In this case, the panel deemed it implausible that the roller coaster had a relationship to the injury.

CASE 7:
A previously healthy 30 year-old man presented to an emergency room complaining of diplopia and cervical pain 2 days after a roller coaster ride.[37] The patient did not note any trauma associated with the roller coaster ride. On examination, the patient demonstrated a right homonymous hemianopsia. Imaging studies revealed a left vertebral artery dissection and left occipital infarction. The patient was anticoagulated for 6 months and subsequently placed on aspirin. At 10 months follow-up, the patient had no recurrent cerebral ischemia.

COMMENT: A 48-hour period without symptoms is atypical for a vertebral artery dissection and the panel felt this case was implausible for an association with the ride.

CASE 8:
A 28 year-old woman without predisposing factors reported a throbbing headache, blurred vision and nausea immediately after a roller coaster ride that persisted for one hour.[37] Computerized tomography and cervical spinal x-rays taken in an emergency room were normal. Over the next two months the patient continued to have headaches lasting 3-4 hours that were described as bilateral and throbbing followed by blurring, nausea, vomiting and neck tenderness. Two months following the ride, the patient presented with severe headache, sleep and memory problems. Her neurological exam was within normal limits. The patient was given the diagnosis of "posttraumatic migraine." She was hospitalized overnight and given 0.5 ml of intravenous dihydroergotamine (DHE) every 8 hours, which relieved her headache. Multiple imaging tests and electroencephalography were all within normal limits She was prescribed several medications including imipramine (anti-depressant) and propranalol (beta blocker) as well as dihydroergotamine nasal spray for breakthrough headaches.

COMMENT: The panel questioned the diagnosis of post-traumatic migraine, especially in the absence of any clear trauma. The panel considered alternative diagnoses such as cervicogenic headache. In its discussion, the panel considered the fact that 18% of the U.S. population suffers from migraine headaches and the incidence of this condition peaks near age 28. In light of these issues, for this case, the panel could not reach consensus on plausibility.

CASE 9:
A 26 year-old student experienced a gradually worsening headache after riding on a double loop corkscrew-type roller coaster ride.[38] The patient did not report any predisposing medical history and denied loss of consciousness or direct trauma during the ride. During the first 2 weeks after the ride, the patient experienced vertigo, photophobia, and partial hearing loss. At 3 weeks, he presented to an emergency room with bilateral subdural hematomas and underwent surgery for evacuation. At six weeks follow-up, he was symptom free.

COMMENT: This 26 year-old man had bilateral chronic subdural hematomas. He developed a headache immediately after his roller coaster ride. The panel deemed this case to be plausible because of the patient's young age and immediate onset of symptoms.

CASE 10:
A 64 year-old medication-controlled hypertensive man rode a roller coaster on 11 different occasions and experienced gradually increasing headache which became so severe that he was unable to continue riding.[44] The headaches continued to worsen after his rides and persisted until ten weeks later when a CT scan of the head revealed subdural hematoma. The hematoma was evacuated and postoperatively, the patient had an excellent recovery.

COMMENT: The panel deemed this case to be plausible.

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CASE 11:
A 31 year-old female dance instructor with a history of migraines developed neck pain and a severe left sided headache 48 hours after an atraumatic roller coaster ride.[10,11] Approximately eight days later, because of continuing symptoms, she was admitted to a hospital where ultra-sonography and magnetic resonance imaging were highly suggestive of vertebral artery dissection (VAD).

COMMENT: Because of the 48-hour time delay to symptoms, in a patient ultimately diagnosed with a VAD, this case was deemed implausible.

CASE 12:
A middle aged female with no predisposing factors developed a right sided Horner's syndrome 8 days after an atraumatic roller coaster ride.[11] On MRI, a right internal carotid dissection was noted. The patient was anticoagulated and placed on aspirin after 3 months. At that time, MRI and MRA showed a normal carotid artery.

COMMENT: This patient developed neurological symptoms eight days after a roller coaster ride and was hospitalized weeks later. The panel noted internal inconsistencies in the information presented (*e.g.* text and table differed) and concluded that there was insufficient evidence to ascertain plausibility.

CASE 13:
A 29 year old female with a history of migraine experienced headache and intense left cervical pain six days after a roller coaster ride.[11] Eleven days after the ride, she developed right hemiplegia and a left hemispheric infarct secondary to a dissection of the left internal carotid artery. Hemiparesis persisted one month later.

COMMENT: The six day delay in symptom onset is inconsistent with the clinical presentation of internal carotid artery dissection (ICAD), making it unlikely that the ICAD developed at the time of the ride. Inconsistencies in the text of the report led the panel to conclude that there was insufficient evidence to ascertain plausibility.

CASE 14:
A 29 year-old female without any predisposing conditions developed headache, cervical pain, vomiting, and fever 2 days after a roller coaster ride. CT scan revealed a left cerebral infarct. Three months later, following medical therapy, she had recovered completely.

COMMENT: Multiple internal inconsistencies were noted in the report of the case. The panel believes there was insufficient evidence to ascertain plausibility.

CASE 15:
One hour after a roller coaster ride, a 23 year-old Chinese architectural student with dorsal scoliosis was admitted to the hospital because acute brainstem dysfunction and neck pain.[11,39] On examination, left cerebellar incoordination, mild right arm weakness, mild left hearing loss, diplopia, and dysphagia were noted. Brain MRI demonstrated a Chiari 1 malformation, associated with cervical syringomyelia. Within 48 hours, the patient experienced a spontaneous recovery excluding a mild ataxia in his left hand and mild dysphagia.

COMMENT: Because the patient had an underlying syringobulbia, the panel felt that many other events closer to the symptoms, such as coughing, would actually be more likely to lead to the increased pressure to turn the underlying condition into an acute problem. The panel did not reach consensus as to plausibility of this case.

CASE 16:
A 31-year-old male with no predisposing conditions developed a transitory, aphasia, left eye visual loss, and generalized convulsions 24 hours after a fixed theme park ride. On presentation, the patient had aphasia, right-sided weakness and was diagnosed with left internal carotid artery dissection. The patient was treated with heparin and valproic acid. Six months later, the internal carotid artery was normal but a motor deficit and severe aphasia persisted.

COMMENT: The panel deemed this case implausible because the 24-hour delay from the ride to the onset of symptoms is not consistent with the usual presentation for internal carotid artery dissection.

CASE 17:
A 35 year old female with a history of migraine headaches hit her head during a roller coaster ride and experienced 2 episodes of left lateral homonymous hemianopsia lasting 30 minutes and 2 hours respectively with six hours between them.[11] Two weeks after her ride, she was hospitalized for visual disturbances, right-sided neck pain and headache. MRA and duplex exam disclosed a dissection of her right internal carotid below the bulb and ar. MRI of her skull was unremarkable. She was treated with anticoagulants for 3 months. A that time repeat brain MRI and MRA showed a normal internal carotid artery.

COMMENT: In this case report, the panel found several inconsistencies in addition to the two-week delay from the ride to the diagnosis of carotid artery dissection in this patient. The panel felt that there was insufficient evidence to ascertain plausibility.

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CASE 18:
A 47 year-old male physician without risk factors had a transient episode of severe nausea and dysequilibrium immediately after a roller coaster ride.[40] Seven days after the ride, the patient noted the sudden onset of diffuse headache, nausea, and vomiting. Eleven days after the ride, he was seen in the hospital where he was diagnosed with cerebral contusions and a subarachnoid hemorrhage. The patient recovered and was discharged a week later with only a mild headache.

COMMENT: It is unlikely for patient with a subarachnoid hemorrhage to remain asymptomatic for more than a week. The panel deemed this case to be implausible.

CASE 19:
A 24 year-old female without risk factors reported immediate onset of headaches after her latest of numerous roller coaster rides. Nearly three months transpired until a subdural hematoma was diagnosed, but the intraoperative findings were consistent with a long-standing or chronic subdural hematoma.

COMMENT: Although it was nearly three months until a subdural hematoma was diagnosed, both the history and findings were consistent with a chronic subdural hematoma that had been present for some time. The panel deemed this case to be plausible.

CASE 20:
A healthy 11 year-old boy experienced an immediate generalized headache after a roller coaster ride came to a sudden stop.[13] The headache persisted for one week and then resolved. Subsequently, the boy went to another amusement park and rode several rides. He developed recurrent symptoms and imaging studies ultimately suggested left vertebral artery dissection. The patient was anticoagulated. His recovery was described as excellent with minimal residual impairment.

COMMENT: In this case, the association of the injury to the ride was believed to be plausible by the panel.

3. *STRENGTHS AND LIMITATIONS OF THE MEDICAL LITERATURE AS A DATA SOURCE*

The panel discussed the relative strengths and weaknesses of the medical literature as a data source. While the literature is commonly cited by the popular press as evidence that there may be a problem with fixed theme park rides, in point of fact the literature is limited to 20 case reports, fewer than half of which appear to be plausible. In contrast to randomized, controlled clinical trials or other controlled studies, case reports and case series cannot be used to generate incidence data. Individual physicians voluntarily report cases. Reporting is not systematic. It is highly dependent on individual author and journal editor interest. Although useful for establishing case type and raising issues that might be addressed by controlled studies, case reports cannot be used to determine the incidence rate nor magnitude of an association. The panel discussed the fact that reporting rates historically tend to increase when attention is focused on a topic. Yet, the panel pointed out that by any standard the absolute number of each type of case reported in the medical literature is exceedingly low.

4. *DATA ON G-FORCES AND THE PHYSIOLOGICAL EFFECTS OF ACCELERATION*

The G-force data in the aeronautical and biomedical literature is extensive and involves in aggregate thousands of subjects. Although there are limited studies actually performed on roller coasters, there are many studies that replicate or exceed the accelerations reported on such rides. Of note, many of the effects of high G-forces are predictable and reproducible in the laboratory (such as G-LOC). There are no data in this extensive literature that describes the types of neurological injuries that the panel was asked to review.

The data reviewed from the 128 roller coasters at Six Flags appeared to be internally consistent. It was felt likely to be representative of all roller coasters for two reasons: First, there are a limited number of ride manufacturers producing nearly all of the roller coasters in operation worldwide and; second, the 128 rides constitute a very large sample of the total number of roller coasters currently in operation. Even allowing for some variance in the rides (*e.g.* the G-forces experienced at different positions on the cars might differ to a small degree), only one ride may exceed proposed standards. Furthermore, this data did not show any trend suggestive of increasing G-forces in the lateral or vertical axes. Overall, the panel felt that the face validity of the data appeared to be reasonable, and this was the only criterion available for its evaluation. It was felt that it would also be useful to have data on angular accelerations at head level, but this information was not available. The G-LOC phenomenon is well described and predictable when high G-forces for sufficient duration cause diminished blood flow to the brain. If G-LOC occurred during roller coaster operation, the panel hypothesized that loss of limb control might be a significant issue. However, no data were presented that would suggest G-LOC should occur at the G-force magnitudes and durations reported for the 128 fastest Six Flag roller coasters. The panel questioned whether in a large enough sample of possibly poorly conditioned individuals if G-LOC could potentially occur and if so, what might be its consequences. It was felt that if this occurred often there would likely be many more abrasions, lacerations and contusions on the heads and limbs of riders as well as many people complaining of neck soreness than are currently reported. Nevertheless, the panel discussed the possibility of in-vivo surveillance monitoring across large numbers of riders to see if G-LOC even occasionally occurs.

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The panel discussed the fact that high magnitude, short duration G-forces are experienced daily in all types of normal activities (*e.g.* sneezing) without significant injuries being reported. The panel felt that this type of information is useful for the public to provide context for the types of G-forces experienced on roller coasters.

The panel made two summary observations regarding the G-forces data. First, the G-force literature does not show an association between increasing G-forces and the neurological injuries under review. Second, G-forces do not appear to be increasing on fixed theme park rides.

5. *Published Case Series*

In addition to the individual case reports, the panel reviewed the two case series that have been published in the world's literature. Although each of the cases from the French paper by Ketaneh, *et al.* is reported individually above, the panel made several overall comments on the article. First, it seemed unusual to have 6 cases in three years from one group of hospitals and the panel suggested detection bias might be present. Second, the panel was troubled by a number of inconsistencies between the summary table and the actual text of the case reports. As a result, many of these cases were deemed to have insufficient data to assess plausibility.

A second case series, which appeared in the journal *Annals of Emergency Medicine*, was also reviewed by the panel.[45] The panel strongly disagreed with some of its key conclusions. First, use of CPSC data to make general statements related to brain injuries is not recommended given the fact that the neurological injuries under review are absent from the NEISS data that forms the statistical sample of the CPSC report. In other words, the NEISS data appears not to be capturing these brain injuries and therefore should not be used to make inferences or conclusions about such injuries. Second, there is no evidence that has been reported to indicate that G-forces and durations sufficient to cause G-LOC are associated with subdural hematomas or arterial dissections. From aeronautical data using centrifuge studies, the most severe injury of pilots experiencing G loads of 10 -15 G for much longer duration is neck sprains.

6. *Review of the National Survey of Neurosurgeons*

The 282 neurosurgeons that responded to the survey were from practices in 45 states. Of all participating neurosurgeons, 38% were academic and 62% were non-academic. The majority practiced in an urban setting (66%). Ninety-two percent of neurosurgeons were board certified. Thirty-seven percent practiced within 30 miles of a fixed theme park. Of these, 33 neurosurgeons reported having specifically treated a total of 50 individual patients in the last five years who might have been injured on a normally functioning ride with appropriate rider behavior. Of these, approximately half were neck and back injuries.

This data was used to estimate the incidence rate for each of the neurological injuries under review. For the purpose of these calculations, the sample of neurosurgeons participating in the survey (7.2% of active U.S. neurosurgeons) was assumed to be representative of all U.S. neurosurgeons. Second, the number of fixed theme park rides delivered per year in the U.S. was estimated as the product of the number of visitors to U.S. fixed theme parks per year and the average number of rides per visitor. According to the International Association of Amusement Parks and Attractions (IAAPA), approximately 320 million people visited fixed theme parks in the U.S. last year and participated in an average of 10 rides per visitor or, 3.2 billion rides. Using this estimated 3.2 billion rides delivered per year in the United States as the denominator, the following incidence rates for the types of non-traumatic neurological injuries (excluding back and neck injuries) in a normally functioning ride with appropriate rider behavior were estimated from the survey as 23 cases per billion rides. This decreased to 16 cases per billion rides when cases with predisposing conditions were excluded. The types of neurological injuries collected in association with fixed theme park rides (although not necessarily caused by the rides) were: subarachnoid hemorrhage (10.3 cases per billion rides), subdural hematoma (5.1 cases per billion rides), internal carotid artery dissection (2.6 cases per billion rides), vertebral artery dissection (1.3 cases per billion rides), and intraparenchymal hemorrhage (1.3 cases per billion rides).

The survey also compared the idiopathic (also called spontaneous) occurrence of the same neurological events seen by the same neurosurgeons and identified a ratio of .025 over the last year and 0.028 over the last 5 years.[b] This means that it was 40 times more likely for a neurosurgeon in the survey to see these same rare events (*e.g.* vertebral artery dissection) occur in patients without any known cause (idiopathic) than to see a patient present with such an event in association with a fixed theme park ride. This figure also reflects the fact that only a small fraction of most individual's time is spent on theme park rides.

In evaluating predisposing conditions, the survey found that the 44% of fixed theme park related neurological injuries reported a suspected predisposing condition, although most of these predisposing conditions differed from each other. In terms of outcome, the majority of fixed theme park related injuries in a normally functioning ride with appropriate rider behavior (68%) had complete resolution without disability.

The panel reviewed the preliminary data from the national survey of neurological surgeons. Several concerns were noted. First, it was felt that the survey assumed that each reported

[b] Incidence rate in number of events per million people per year in the United States for idiopathic events and for fixed theme park ride related events as a ratio of fixed theme park ride events to both combined.

case was unique. In other words, it assumed that each patient only visited one of the neurosurgeons in the panel. One of the panelists, with experience in the chiropractic literature, noted that in studies of chiropractors and vertebral artery dissections more than one neurologist sees many of the patients. If this were true for this survey, the data would tend to overestimate cases. Second, recall bias was noted as a potential flaw in the neurosurgeon's estimates of the numbers of particular cases they would report having seen. This could lead to either under or over estimation. The recall of specific cases provided the most useful information, but would require the same degree of case-by-case review for plausibility as performed on the world's literature. With these caveats as to the accuracy of the survey data, meaning at best they may be used as an imprecise estimate of the incidence rate for these events, if one were to calculate the relative risk of these injuries for riders versus non-riders that number may well be very high, but the problem to society is negligible for any person without a known risk factor.

IV. Deliberations: Commentary

In the course of its deliberations, the panel discussed a number of key questions summarized below.

A. What is the state of the medical literature on neurological injuries and fixed theme park rides?

The panel found the sum total of the world's medical literature on neurological injuries in association with fixed theme parks to be limited to fewer than two dozen cases. These were presented either as individual reports or short case series. Many of the cases were reported as letters to the editor rather than peer reviewed presentations. Some of the cases are repeated from series to series giving the impression that there are more distinct cases than have actually been reported. Critical review of the cases in the literature in which an association has been described between neurological injuries and fixed theme park rides demonstrated a plausible association in only 9 of 20 cases. On the basis of standard assessment of medical evidence, the literature describing neurological injuries and fixed theme park rides was deemed to be at the weakest level.

B. What is the incidence of fixed theme park related neurological injuries?

Determining the incidence rate of neurological injuries that can be clearly attributed to fixed theme park rides is difficult. First, the absolute number of reported cases in the world's literature is extremely low. Second, there is no existing data source, from the health care system, the theme park industry or the CPSC/NEISS system that has the methodology to capture these types of incidents in a valid and systematic way. Without any valid, systematic approach to capturing or verifying suspected incidents, a determination of incidence cannot be made. Third, complicating this assessment is the fact that there is a steady background incidence rate of these same neurological injuries that occur without known cause. For example, internal carotid artery and vertebral artery dissections alone occur with a combined "spontaneous" incidence rate of approximately 4 per 100,000 per year. Subarachnoid hemorrhages occur 5-8 per 100,000 and other intracranial bleeds occur at a rate of 10-20 per 100,000 per year. With hundreds of millions of visitors to fixed theme parks each year, and 365 days in a year, the probability is that hundreds of these people will have their "spontaneous" events occur either in a theme park or within a few days of having been to a theme park. Fourth, case reports in the medical literature cannot be used to determine incidence rates. Case reporting is not systematic and the number of published case reports tends to increase when attention is focused on a particular topic. Despite this, the actual number of plausible case reports is extremely low (determined to be 9 by the panel). Although the survey data provided some incidence statistics as a function of the estimated number of fixed theme park rides, this data was preliminary and had some design flaws as described earlier. Although the actual incidence of these neurological injuries cannot be precisely quantified given current data sources, the panel felt it to be likely that these events are occurring at an extremely low rate.

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C. WHAT IS THE MAGNITUDE OF THE PUBLIC HEALTH RISK?

The panel emphasized that these are extremely rare cases. Given the number of rides delivered per year in the United States, (estimated at 3.2 billion), the absolute risk for any individual to suffer one of these neurological events as a result of a fixed theme park ride is exceedingly low.[c]

D. WHAT ARE THE PREDISPOSING CONDITIONS AND WHO SHOULD NOT GO ON A FIXED THEME PARK RIDE?

There were no clearly predisposing conditions identified in the review of the literature. Two patients with a history of anticoagulation presented with subdural hematomas, and it was suggested that older patients on anticoagulation might be at higher risk, it was not clear how to quantify such risk. One panelist with expertise in vertebral artery dissection, reported that there is some evidence that certain individuals may have a genetic predisposition for a dissection and, this might explain the cases of vertebral artery dissection reported with minor trauma (e.g. leaning backwards at a beauty parlor, chiropractic manipulation, and, possibly roller coasters). But, there are no reliable methods to screen for such at-risk persons.

The panel felt that one area for future investigation would be to identify as many specific case histories as possible to try to further define risk factors.

E. ARE NEUROLOGICAL INJURIES INCREASING?

There is no evidence that these injuries are increasing. First, upon close inspection, the CPSC data has not effectively collected data on these specific types of cases. Therefore, it is not useful for describing incidence rates for these injuries. For example, if one used the CPSC data for these neurological injuries, the rate would be near zero for the last 12 years. Second, the increase in reports in the medical literature in the last decade compared to the prior decade is not useful. Medical literature reports are not systematic and they are flawed. For example, the world's literature reports 8 cases in the U.S. (both plausible and implausible) and 6 cases from France. Yet, the U.S. population is several fold greater than the French population. As a rhetorical question, the panel asked, "Is the problem five or six times more likely to occur in France?" In addition, on closer inspection, more than half of the reported cases in the world's literature failed to achieve a minimal level of plausibility. We cannot assess change in rates without even knowing what the incidence rate really is. Reliable incidence data from a trusted data source does not currently exist. A system to capture such data does not yet exist either. The panel determined that the incidence rate is unknown. Any claims that neurological injuries are increasing are not substantiated.

F. DOES ACCELERATION (G-FORCES) CAUSE THESE INJURIES?

Although much has been stated in the popular press and even one published medical article regarding G-forces and neurological injuries, many of those statements are actually inconsistent with the evidence. There is a large body of experimental research on multiple subjects regarding the effects of acceleration on the human body. None of these studies mention a case of neurological injuries that are being reported to occur on fixed theme park rides. Furthermore, in the laboratory, the human physiological and neurological response to acceleration is consistent and reproducible, yet these events, specifically G force induced loss of consciousness (G-LOC) are generally not reported on fixed theme park rides. One difference is that fixed theme park rides, like sneezing or falling back into an easy chair, are rapid acceleration events of short duration while most G-force induced physiologic events, such as G-LOC, are dependent on the duration as well as the acceleration. As one panelist summarized, "review of the substantial literature on human anomaly centrifuge data reveals no physiological evidence supporting the notion that subdural hematomas [or other neurological injuries] are associated with increased G-forces." An alternative hypothesis is that the physics and experience of the rider in a fixed theme park ride is fundamentally different physiologically than in a centrifuge or an airplane. The panel considered this to be extremely unlikely. Another possibility is that with hundreds of millions of riders per year, these rare events represent the tail ends of a physiologic distribution that might never be captured in human experimental data alone

The panel considered ways to augment the current knowledge base to evaluate these issues more directly. The panel hypothesized that utilizing a dummy instrumented with a six degrees of freedom accelerometer on the rides might more accurately reflect head movements and the full range of accelerations and, if performed with both normal and zero neck tension, might predict what could occur if a rider actually did experience G-LOC. Furthermore, this approach could be useful towards collecting information that might help develop more advanced research simulators. Another approach to better understanding the range of responses to the acceleration of a fixed theme park ride is to use video cameras on actual rides. If possible, such cameras might enable the documentation of a much larger sample of actual motion of the heads of riders in all three axes and whether or not G-LOC is ever documented. Data from these types of experiments would be useful for setting acceleration standards, evaluating restraints and other protective methodologies, and extending the potential scope of restrictions and warnings.

[c] The panel also suggested that in the future there would be value in a comparative evaluation of the risk of fixed theme park rides versus other recreational or sporting activities. Such information would provide the public more contexts for assessing this activity versus others that they commonly participate in.

G. Are G-forces increasing?

The panel specifically addressed the question of whether G-forces are increasing. The common assertion that g-forces have increased secondary to increases in ride height and speed is abjectly false. Ride heights and speeds can increase without changing the G-forces and, in fact that appears to be the case. Data from the 128 roller coasters at Six Flags Theme Parks over the last several years do not show any pattern suggestive of upward change in the G-forces experienced on roller coasters in the vertical and lateral axes. Further, because of the relatively small number of ride manufacturers and the number of roller coasters represented by this sample, this G-force data was felt likely to be representative of the majority of fixed theme park rides.

In summary, there is a large body of existing data regarding the effect of G-forces on the human body. Nothing in the G-force literature to date reflects the types of neurological injuries being reported in association with fixed theme park rides. The panel contested the assertion that G-forces are causing these injuries as being unsupported by any data that the panel reviewed. The panel made recommendations regarding how to potentially improve the overall fund of knowledge and design safety with respect to specific acceleration effects that may uniquely occur during fixed theme park rides. Finally, while the rides may be larger and faster, there is no evidence that the G-forces experienced by the riders are any greater now than they were 10 or even 20 years ago.

H. Mechanisms of Injury and Avoidable Events

One problem in isolating a mechanism of injury is that the types of cases reported are so varied, and, in fact, have different mechanisms of injury in their usual presentation. The panel considered all of the presented cases. With the exception of an anti-coagulated, elderly patient, experiencing a subdural hematoma, the panel could not identify a clear mechanism of injury for a truly atraumatic ride leading to any of the proposed injuries. However, a fixed theme park ride can be considered an exertional activity, and, therefore, certain conditions that might be precipitated or "harvested" by exertion could potentially occur more readily on a roller coaster.

The search for mechanisms of injury and predisposing conditions was aimed at identifying potentially avoidable neurological events. If these events are truly random occurrences, little can likely be done to significantly alter their occurrence. If these events are happening as a result of the ride, there should be a scientific way to investigate what the mechanism is. If some trait of the rider or some engineering aspect of the ride can be identified to be contributory or causative, then there is an opportunity to create measures to avoid at least some events.

I. Designing future studies

The panel discussed potential issues with developing future studies because of the attention that has been focused on this issue. There are many potential avenues for bias in designing studies to evaluate causality, especially when the topic has reached a certain level of physician and patient awareness. Extensive epidemiological expertise and review would be needed to design a valid study for these issues.

J. Assessing Causality

As described, the panel utilized a framework for evaluating the issue of causation. The Bradford-Hill criteria cite the strength, consistency, specificity and temporality of an association as well biologic plausibility and demonstration of a dose-response gradient as key factors in determining causation. To summarize the findings of the panel with respect to the Bradford-Hill criteria, the following observations were made: Determining the strength of the association was limited by the lack of reliable incidence statistics and therefore the panel was unable to evaluate absolute risk (or the incidence rate difference between riders and non-riders); relative risk (or the injury rate among riders divided by the rate among non-riders) or the attributable risk (absolute risk divided by incidence rate). Based on the preliminary data from the survey on neurosurgeons, it was felt that the relative risk, if calculable, would likely be high. With regard to consistency, not only could specific rides not be implicated, but also the actual injuries appeared to be varied. Only temporality of the association, meaning that the ride immediately preceded the injury, could consistently be demonstrated in the case reports. The issue of dose response was not evaluable. Although several of the case reports described multiple ride encounters, in point of fact, most visitors to fixed theme parks will ride on average 4.5 roller coasters (data source: Six Flags) to 10 total rides (data source: IAAPA) in a single park excursion. Finally, biologic plausibility was questioned. The panel wrestled with a dichotomy. While in some of the case reports, such as when the rider experienced the onset of symptoms during the fixed theme park ride, it seemed plausible that something may have occurred during the ride. However, data from human experiments of acceleration does not support a cause and effect relationship between increasing G forces and the described neurological injuries in the literature. While the panel felt that in some of these rare situations the ride seemed causally related to the event, the Bradford Hill criteria for causation remained unsatisfied.

K. Future Directions

Recognizing the deficiencies in the existing data, the panel discussed possible approaches to improving the overall fund of knowledge. The panel determined that (in addition to the

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acceleration testing described in F above) at least three avenues of investigation might be considered. First, more information was needed on case definitions. In other words, while there are sporadic reports of several different types of neurological injuries in association with fixed theme park rides, each of these types have not been further assessed. The best approach to this would be to identify as many cases as possible and to critically review each case. Suggested sources for such cases were the neurosurgical practices used in the survey and claims databases. Once the cases were collected, either via a standardized abstraction template or via a summary case description by a clinician, the cases would be systematically reviewed for plausibility and catalogued. This information would establish case definitions and would therefore be useful for designing future research or surveillance programs.

The second area discussed was the design of an epidemiological study to determine causality. The panel warned that as the issue becomes increasingly discussed in the media and the medical literature, there is an increasing risk of detection bias and other biases which could invalidate an otherwise well constructed study. Any proposed study should undergo substantial design and review to attempt to avoid these and other pitfalls.

The third area discussed was the establishment of a surveillance system. Structured and prospective surveillance could potentially generate both neurological injury data and even ride specific data. The panel pointed out that even if there is not a problem today, new fixed theme park rides are continually being introduced. The advantage of a surveillance system would be that it could serve an early warning function by detecting changes in certain "sentinel" events. Unfortunately, the NEISS system does not fulfill this function. The panel felt that such a surveillance approach would require the cooperation of statistical sample of critical path caregivers (i.e. the clinicians most likely to see certain types of neurological injuries) and would have to be specifically developed for this purpose. In the case of either controlled clinical research or surveillance, because the expended resources on a per case basis might be considerable, any prospective data collection approach considered should be preceded by a feasibility evaluation.

It was further suggested that a research program could be undertaken in conjunction with the US Air Force for utilization of their centrifuge and fully instrumented subjects in order to study the physiological mechanisms associated with reactions to the specific pattern of accelerations present in the rides under consideration.

L. CONCLUSIONS

The literature describing neurological injuries with respect to fixed theme park rides is clearly inadequate as a basis for conclusions and recommendations. Critical review of the cases in the literature in which an association has been described between neurological injuries and fixed theme park rides demonstrated a plausible association in only 9 of 20 cases. Both the current literature and other data sources reviewed were determined to be inadequate for assessing the strength of such an association. Finally, the existing literature provides no insight as to whether fixed theme park rides have become more or less dangerous over the past few years.

Additional efforts should be made to develop and evaluate data sources to help identify other types of cases that may exist. Even with a very low incidence of injuries that may be attributable to fixed theme park rides, there would be value in further delineating the types of cases that exist beyond those reported in the current literature, with particular interest in identifying any injuries that may be avoidable. The feasibility of a prospective data collection approach for ongoing surveillance should be evaluated. It should be noted that any epidemiological study designed to rigorously evaluate incidence and causality for these neurological injuries would be limited by significant potential for bias. Any proposed study should undergo extensive design and review because the potential for such bias is very high.

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TABLE 1.
TWENTY REPORTED CASES IDENTIFIED IN LITERATURE REVIEW.

Author	Injury	Age (years)	Country
German, et al[33]	Subdural hematoma	66	USA
Scheer, et al[7]	Carotid artery dissection	13	USA
Senegor, et al[8]	Subarachnoid hemorrhage	32	USA
Schievink, et al[34]	Cerebrospinal fluid leak	39	USA
Snyder, et al[35]	Subdural hematoma	77	USA
Bateman, et al[36]	Brown-Sequard syndrome	37	USA
Burneo, et al[9]	Vertebral artery dissection	30	USA
McBeath, et al[37]	Post-traumatic headache	28	USA
Fernandes, et al[38]	Subdural hematoma	26	CANADA
Bo-Abbas, et al[44]	Subdural hematoma	64	CANADA
Biousse, et al[10]	Vertebral artery dissection	31	FRANCE
Gadenne, et al[12]	Vertebral artery dissection	29	FRANCE
Kataneh, et al[39]	Syringobulbia	23	FRANCE
Nencini, et al[40]	Subarachnoid hemorrhage	47	ITALY
Fukutake, et al[43]	Subdural hematoma	24	JAPAN
Lascelles, et al[13]	Vertebral artery dissection	11	UNITED KINGDOM
Ketaneh[11]	Carotid artery dissection	53	FRANCE
Ketaneh[11]	Carotid artery dissection	29	FRANCE
Ketaneh[11]	Carotid artery dissection	31	FRANCE
Ketaneh[11]	Carotid artery dissection	35	FRANCE

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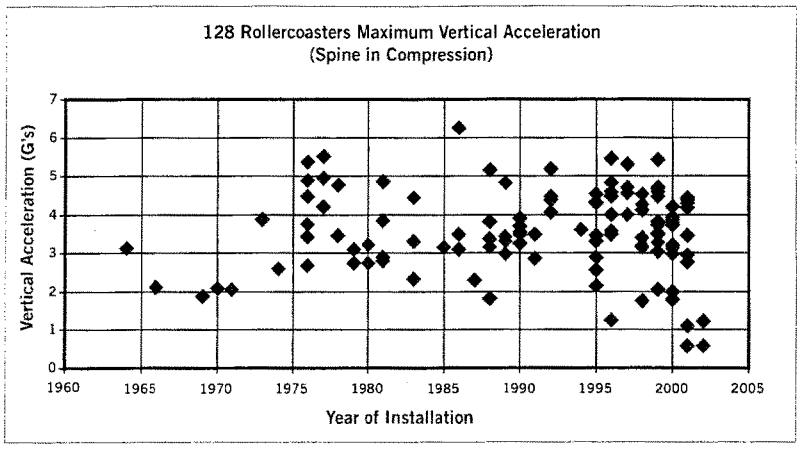
EXHIBIT 1



Source: Six Flags Theme Parks, Inc.

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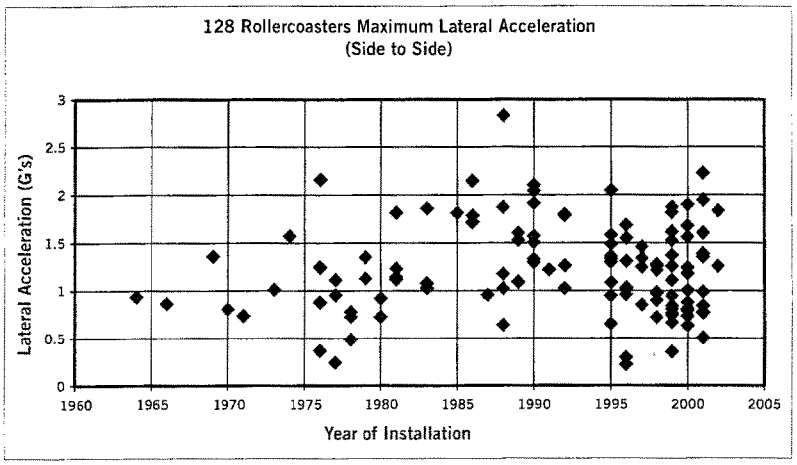

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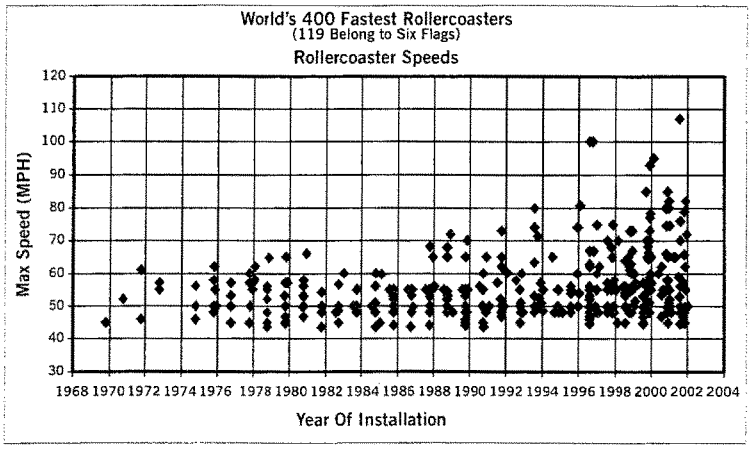

Source: Roller Coaster Database (RCDB.com), 2002

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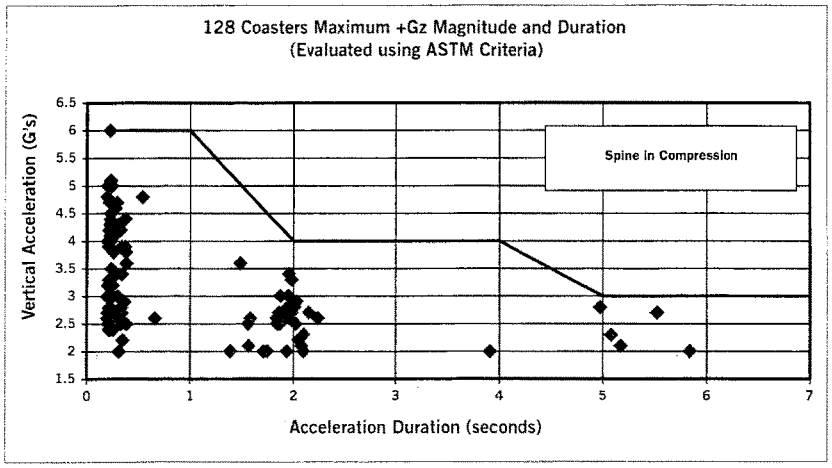
EXHIBIT 4



Source: Six Flags Theme Parks, Inc.

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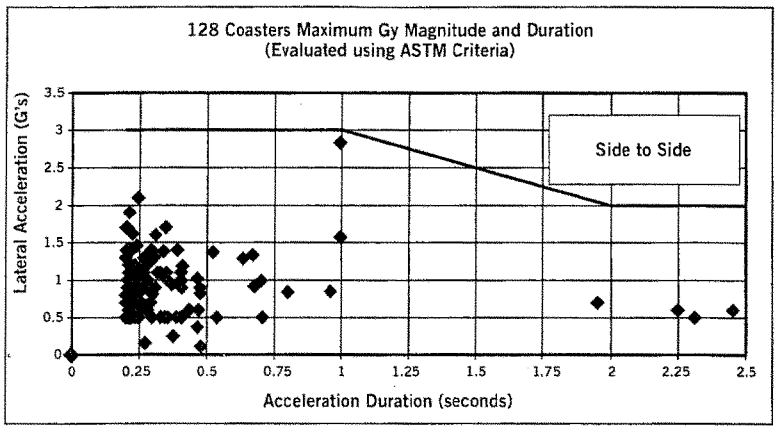
EXHIBIT 5



Source: Six Flags Theme Parks, Inc.

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EXHIBIT 6

Human subject testing: Head accelerations during common activities.

X Accelerations (Fore-Aft)		
Task	Duration (s)	Peak
Swing	1.74	2.7
Obstacle Course	0.07	2.6
Obstacle Course	0.62	1.6
Sneeze	0.83	3.9
Falling Down	0.13	16.3
Pillow Strike	0.01	28.1
Pogo Stick	0.30	4.1
Spinning on a tire swing	26.18	1.7

Y Accelerations (Lateral)		
Task	Duration (s)	Peak
Swing	-	-
Obstacle Course	0.29	2.6
Sneeze	0.63	1.6
Falling Down	0.10	4.2
Pillow Strike	0.01	11.0
Pogo Stick	0.36	1.3
Spinning on a tire swing	-	-

+Z Accelerations (Head To Toe)		
Task	Duration (s)	Peak
Swing	2.74	1.4
Obstacle Course	0.04	2.3
Sneeze	0.95	2.5
Falling Down	0.03	8.4
Pillow Strike	0.02	14.6
Pogo Stick	0.48	3.0
Spinning on a tire swing	-	-

-Z Accelerations (Toe to Head)		
Task	Duration (s)	Peak
Swing	0.81	0.7
Obstacle Course	0.03	5.5
Sneeze	0.11	1.0
Falling Down	0.02	7.3
Pillow Strike	0.01	14.7
Pogo Stick	0.19	4.5
Spinning on a tire swing	26.16	2.3

Maximum accelerations and durations found at head for all subjects tested.
Nine subjects tested. Only two tested for sneeze. Peak acceleration units are Gs.
Source: Exponent, Inc. Report: DC18967.000 GOTO 0702 MA01

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Blue Ribbon Panel Review of the Correlation Between Brain Injury and Roller Coaster Rides

February 25, 2003

Blue Ribbon Panel Review of the Correlation Between Brain Injury and Roller Coaster Rides

Brain Injury Association of America
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EXECUTIVE SUMMARY

Findings

1) There is evidence that roller coaster rides pose a health risk to some people some of the time. Equally evident is that the overwhelming majority of riders will suffer no ill effects. Most major categories of at risk populations such as pregnant women or persons with heart conditions, epilepsy, back or neck injury or prior orthopedic surgery, among others, are already warned against riding. People of small stature are usually excluded. Thus, there is risk, but effort is made to warn those at risk to prevent injury.

2) No systematically acquired comprehensive database, longitudinal history or natural history data was available. The Panel's review of the 57 cases of patients who reportedly sustained cranio-cerebral injury related to roller coaster rides over the past 38 years revealed no evidence of ride-related brain injury absent head contact. Furthermore, of the 51 non-fatal injuries, the majority sustained neurovascular injuries, and of the six fatal injuries, all suffered undiagnosed neurovascular abnormalities such as blood vessel abnormalities, malformations or aneurysms. These are risk groups, like those listed in section one above, but unknown to the rider. It is unlikely that the rider's physician, much less the amusement ride owners/operators, could have known that these persons were at risk before the fact.

3) The committee has questions about the methodology of existing measurements of two significant variables on roller coasters as they relate to occupant acceleration: linear and angular accelerations and their duration. Location and type of accelerometers were found to be less than ideal and not as directly relevant to the linear and rotational accelerations of the head as desired. However, improvements in precision and relevance probably would not result in accelerometer findings of more than a 20% difference from those already obtained.

4) The accelerations experienced by roller coaster riders are far below experimentally derived injury thresholds for healthy individuals. The highest advertised roller coaster acceleration levels are 6 g's for 1 second, although instrumented testing suggests a lower maximum of 4.5 g's for 0.5 seconds. In comparison, significant research has been done on healthy individuals regarding the level of sustained acceleration at which blackout can occur and the lowest reported threshold is 5.5 g's over a period of 5 seconds. Animal and other experimental research regarding serious brain injury suggest a much higher threshold (35 g's or more); however, it is not clear how this threshold applies to the healthy, human population.

5) The conclusion supported to date is that the risk of brain injury from a roller coaster is not in the rides, but in the riders. That is, there are some people we already know should not participate in roller coaster rides. The 6 reported fatalities were in a shared, logical, but infrequent risk group that could not be established before the fact.

Recommendations

1) The amusement park industry is rigorously self-monitored and individual roller coaster rides are designed with multiple "fail-safe" features to control risk. Whether their motivations are selfish or responsible, the industries' commercial health is best served by preventing injury. Whether a federal agency could match this is unlikely.

2) Potentially interesting future research would include the collection of more detailed information that could facilitate risk factor and risk group analysis, information related to high frequency riders, individuals with previous/remote history of brain injury/other neurological events, and others yet to be defined.

3) Surveillance methodology through the Centers for Disease Control and Prevention's (CDC) National Center for Injury Prevention and Control (NCIPC) could be developed in order to monitor and track roller coaster associated, injury-related complaints.

4) Riders are encouraged to use common sense. If your neck hurts, you have been diagnosed with a medical or neurological illness, have had recent surgery or if there has been an abrupt change in your physical status or any other unusual or unexplained symptoms, skip the ride.

5) Even with the above considerations, for purposes of improved public information and education, the establishment of a nationwide oversight agency could be developed to assure that the amusement park industry continues to abide by it's own self-imposed safety standards in a consistent manner. In this regard, something along the lines of a Joint Commission on Accreditation of Health Organizations (JCAHO) model is more promising than an Occupational Safety and Health Administration (OSHA)-like model.

"Amusement Parks are limited experiences whose attraction lies in the immediate physical gratification of the thrill ride- the exhilaration of speed, the push and pull of gravity, the rush of adrenalin and the illusion of potential bodily harm."

- Margaret S. King, Ph.D. writing in The Encyclopedia of U.S. Popular Culture

INTRODUCTION

In the Fall of 2001, U.S. Representatives Edward Markey (D-MA) and Bill Pascrell, Jr. (D-NJ), along with 12 additional Members of Congress requested that the Brain Injury Association of America review the most current information on the safety of amusement park rides, mainly roller coasters, as there were concerns by constituents on their safety vis-à-vis acquired neurological traumas. A panel was assembled consisting of scientists in the fields of biomechanical engineering, epidemiology, clinical medicine, basic neuroscience, and neurotraumatology as well as a representative of the amusement park industry who had extensive experience in the design and operation of roller coasters. Beginning in July 2002, a series of biweekly telephone conferences were held to evaluate and review the existing scientific and industry data in this area and to critically analyze the scientific merit of these. This activity culminated in a meeting convened over a three-day period in Alexandria, Virginia in November 2002 to finalize the conclusions and develop a series of recommendations based upon a dispassionate, objective review of all relevant materials.

Amusement Rides

The human body is a wonderfully sophisticated biomechanical system with:

1) A sophisticated accelerometer system in the head that senses motion and responds to it. This is called the *vestibular* system and it resides in the inner ear. It has 3 bilateral semicircular canals that sense angular acceleration and bilateral otoliths that sense translational motion and can determine completely the motion of the head.

2) Position sensors in all of the limb muscles, called *proprioceptors* that give information about the location of all limbs. (You know what position your arms and legs are in without looking at them.) Together with the vestibular system and its accelerometers, these sensors can give the brain complete information about the motion of the entire body.

3) Force sensors in the muscles called Golgi tendons. These sensors are actually telling the brain how hard the muscles are pulling (muscles can only pull).

4) Tactile sensors all over the skin to detect the presence of forces.

5) Sophisticated vision system and sound receptors.

6) A powerful central processing unit (the brain) that interprets all of these inputs and directs the muscles to react.

Amusement rides utilize these biomechanical systems and equally important "the human perception" to entertain and thrill. Ride designers pay particular attention to perception and create an illusion of danger. People ride roller coasters not only for the visceral effects, but also for the perceived "death defying thrills".

A successful roller coaster gives riders the feeling they are in peril, but deep down they know they are safe.

KINEMATICS

The kinematics of a loaded roller coaster moving along a path we know *a priori* can best be described in terms of path variables. The instantaneous acceleration vector of the center of gravity of the vehicle, at any point in time, consists of two components: one component in a direction tangent to the path and a second component (in the osculating plane) at right angles to the path and pointing toward its center of curvature. The tangential component is the rate of change of the tangential velocity while the normal component is the square of the speed divided by the radius of curvature as given in Shames (1996). As the roller coaster moves along its prescribed path, it is very important to note that an acceleration vector is always present and its components change continuously as a function of time. Thus, by virtue of Newton's second law of motion, forces will always be acting on the roller coaster as well as on its occupants.

A potential association between ground acceleration of a vehicle and occupant head injury has been recognized for a long time. The acceleration pulse required to cause physiological dysfunction of the brain of primates has been known since the late 1970's and early 1980's. The paper by Domer et al. (1979) showed an acute change in the function of the blood-brain barrier of rhesus monkeys subsequent to whiplash trauma. Similarly traumatized rhesus monkeys were shown by Liu et al. (1984) to result in subcortical electroencephalogographic (EEG) changes in the limbic system of the brain. The linear and angular accelerations producing these physiological dysfunctions can be theoretically scaled from the rhesus brain to the human brain. Because the rhesus brain is smaller than the human one, the human brain can withstand a lesser acceleration pulse. The only *in vivo* human dysfunctional data is from studies of human volunteers exposed to whole body accelerations in a centrifuge, Whinnery & Whinnery (1990). Data from these studies were used to set limits for accelerations that are applied to humans over several seconds in duration.

Having the acceleration of the center of gravity of the loaded roller coaster, we must now describe its motion about the center of gravity. Without belaboring its mathematical complexities, we can simply state that the motion about the center of gravity can be described by three angles: roll, pitch and yaw. Stated non-rigorously, the moment of the forces acting on the roller coaster is proportional to its angular acceleration. The proportionality constant is the mass moment of inertia matrix of the loaded roller coaster.

Rider Response

Given the general nature of amusement rides it is clear that a human rider does not exactly follow the motion of the vehicle. The human body represents a "viscoelastic mass" and dampens many of the higher frequency accelerations. Generally, acceleration measurements made on the riders are less that those made on the ride with some exceptions, e.g., the body's unique muscular system reacts to sustained forces and can sometimes increase or amplify certain motions. If a roller coaster is in a left turn and the passengers have fully responded to this turn, i.e., their neck muscles are holding their head up straight resisting the lateral force, if the roller coaster suddenly enters a right turn and the muscles may still be trained in the opposite direction and may actually accelerate the head instead of righting it. This phenomenon is sometimes referred to as "neuromuscular addition" and ride designers strive to minimize it to minimize the potential for neck strains.

Therefore, neuropsychologists and biomechanical engineers, who understand the response of the conscious human body to various types of motion, must analyze the resulting accelerometer test data. These specialists analyze the accelerometer data understanding that the human body is a viscoelastic mass and that certain short duration impact accelerations are absorbed or reduced by this viscoelastic mass while others are not.

Measurement of Acceleration on Amusement Park Rides

Accelerometers

Typically, a 3-axes accelerometer is used to measure the acceleration on amusement rides. Accelerometer measurements are made during a normal operating cycle with accelerometer placement and vehicle loading in accordance with the American Society for Testing and Materials standard, ASTM F 2137-01, *"Measuring the Dynamic Characteristics of Amusement Rides and Devices."* This standard includes:

- Accelerometer characteristics and calibration requirements
- Data storage and fidelity
- Accelerometer location and placement
- Testing procedures, including required passenger loading and warm up times to achieve consistent data (especially important to coasters)
- Instructions as to pertinent test conditions that must be documented, e.g. temperature, date, time, etc.

A separate ASTM standard, Z9591Z *"Standard Practice for the Design of Amusement Rides and Device,"* establishes acceleration limits for amusement rides. (This standard is discussed later herein and in the Relevant Standards section of this report.)

Crash Test Dummies

Typically, crash test dummies, such as the Hybrid III dummy, are not used for accelerometer testing of amusement rides. This procedure has been studied and debated for many years by biomechanical engineers who are familiar with amusement rides and have worked in the industry. The consensus of opinion of these experts is that crash test dummies are appropriate in automobile crash testing where they are subjected to high level impact loads, but that they are not appropriate for measuring the sustained type acceleration events of amusement rides. In short, for sustained acceleration events seen on roller coasters, the crash test dummy does not closely mimic the voluntary responses of the human rider.

Human Test Riders

Accelerometers attached to a human rider have been used in special circumstances, but because of differences in the way humans respond to changing forces, it is difficult to achieve repeatability and consistency from multiple tests or run to run.

Standardized Test

It is for the above reason that the new ASTM F 2137-01 defines a standardized practice for acquisition of data related to the dynamic forces of amusement rides with the accelerometers mounted at a specific point in the passenger compartment. This point is defined by ASTM F 2137-01 for both adults' and children's rides and is relative to the rider position during the ride cycle.

Data Conditioning

Vibration

Vibrations, which are accelerations that oscillate rapidly relative to the overall motion, also are modified by the body and may be partially absorbed. The body's tactile sensors may detect these "high frequency" vibrations, but overall motion of the body due to them is minimal. Most people have experienced high frequency vibrations that do not appreciably alter the overall motion. Examples include an out of balance tire on an automobile or that pesky caster on the shopping cart.

Vibrations that persist for long periods of time can be bothersome to humans, not from the standpoint of injury, but rather from fatigue. The body of knowledge for this type of "whole body vibration" and the resulting "fatigue reduced proficiency" is covered in the International Standard, ISO 2631. Its primary use is for long-term exposure to various occupational vibrations (heavy equipment operators, truck drivers). Amusement ride cycles are rarely long enough for vibration-induced fatigue to be a factor.

Noise Filtering

Test engineers may employ filters to remove extraneous vibration and noise from the test data in order to see more of the overall movement of the amusement ride. This is normally done electronically on the digitally stored data, but also can be done directly on the accelerometer signal. The disadvantage of the latter being that some frequency related analysis may not be possible after the filtered data is stored. For this reason, the standard filtering method is electronic and ranges from 5 Hz to 100 Hz depending on the specific analysis being made. For purposes of evaluating amusement rides relative to a standard acceleration limit, ASTM standard Z9591Z specifies 5 Hz, but different types of analyses are routinely made at other filter rates.

Amusement Ride Acceleration Limits

Background

ASTM Z9591Z *"Standard Practice for the Design of Amusement Rides and Devices,"* establishes design acceleration limits for roller coasters and most other amusement rides. The ASTM technical committee that developed these limits included the expertise of:

- Aerospace Medicine
- Biomechanical Engineering
- Biomedical Engineering
- Neuropsychology
- Amusement Ride Engineering
- Amusement Ride Manufacturers
- International Standards Organizations (TUV, CEN, Russian Standards)

This standard also drew from the important criteria, information and findings of other standards such as the "Central European Norm," which was developed over the last 10 years by the European Union.

Acceleration Limits

Three acceleration axes and directions, +X, -X, +Y, -Y, +Z and –Z, are considered in the ASTM standard, including combinations of accelerations. The ASTM standard vernacular, borrowed from the U.S. Navy, is as follows:

Linear Motion	Direction	Vernacular
Forward	+X	Eyes In
Backward	-X	Eyes Out
To Left	+Y	Eyes Right
To Right	-Y	Eyes Left
Upward	+Z	Eyes Down
Downward	-Z	Eyes Up

The term "eyes in" for forward acceleration simply means that the eyes are tending to be forced further back in your head by the acceleration. Eyes down for upward acceleration simply means that your eyes would tend to be forced further down by the acceleration. As one can see from the vernacular, the response of the rider is really opposite to the direction of the acceleration. For example, entering a loop on a roller coaster results in +Z acceleration, where your eyes (and the rest of your body for that matter) are forced downward.

The ASTM acceleration limits include a "time duration element". As the duration of the acceleration increases, the acceleration limit decreases. This is due to the fact that: a) blood flow in the body is time dependent and it takes a few seconds for the blood to be reduced or increased in the head and b) fatigue can become a factor. Riders can brace themselves just fine for a few seconds and it takes a few seconds to become faint, but for longer periods of time, feeling faint or fatiguing of neck or other muscles may occur.

The ASTM standard also addresses other limits:

1) Limitations on reversals to minimize the additive effects of muscular responses (neuromuscular addition).

2) Restrictions in transitions from weightlessness to high positive accelerations. This is to allow the body to regain postural control and to allow the heart time to recover if the weightlessness was of any significant duration.

3) Limitations in how accelerations from more than one axis can be combined, i.e., the maximum acceleration limits from two axes are not allowed at the same time.

(See Appendix A for a complete version of the ASTM acceleration limits.)

Acceleration of Common Amusement Rides

The following chart is a summary of some of the more common, generic amusement rides and their approximate peak acceleration levels. Note that the $+G_z$ levels are inclusive of gravity.

Ride Type	Ride Description	$+G_x$ Eyes Back	$-G_x$ Eyes Front	G_y Eyes L/R	$-G_z$ Eyes Up*	$+G_z$ Eyes Dn*
Coaster	Catapult launch steel rail coaster	1.3	-1.5	2.0	-0.5	6.0
Water Ride	Flume ride with big drop	0.8	-1.0	0.9	0.1	3.1
Simulator	6 degree of freedom motion base	0.7	-0.8	0.7	0.3	1.5
Himalaya	Centrifugal rotating with ups and downs	1.0	-0.1	0.7	0.4	1.5
Rotor	Centrifugal; floor drops out	2.5	-0.3	0.2	0.8	1.2
Frisbee	Pendulum with rotating disc	1.8	-0.3	0.3	0.1	3.8
Teacups	Scrambler type ride	1.1	-0.1	0.4	0.7	1.0
Breakdance	Scrambler type ride	2.3	-1.1	1.0	0.3	1.9

*G_z Levels include Gravity of 1 G.

Everyday Life Accelerations

Several researchers have examined the head acceleration values resulting from everyday activities. While the results of such studies have yielded some surprisingly high numbers, it is important to note that maximum or average acceleration alone is a poor index of the injury potential of a particular activity. For example, simply striking oneself in the head with the heel of the hand can produce as much as 10 g's of maximum acceleration for a short time, but has little injury potential. Conversely, occupants in experimental rear impact motor vehicle collisions report minor symptoms of neck strain with head acceleration of only 2-3 g's (Siegmund et al. 1997).

There are several reasons for this disparity: the duration of the acceleration must be taken into account (the hand strike example produces only a few milliseconds of acceleration pulse, whereas the experimental crashes produce approximately 100 milliseconds of peak acceleration). Additionally, the differential acceleration produced by the activity must be considered. In other words, activities in which the entire body is accelerated as one unit will not produce injury at the same rate as other activities that result in a difference between torso and head acceleration. For example, a sneeze has

been reported by Allen et al. (1994) to produce as much as 2.9 g's of peak head acceleration. The head acceleration results solely from the muscular contraction of the sneezer and has relatively minimal injury potential because the braced sneezer is prepared for the sudden head movement. In contrast, the unprepared occupant in a rear impact motor vehicle collision has a higher injury potential because he or she is not causing or bracing for the acceleration, and the impact with the seatback results in a difference in acceleration between the head and torso. The same principles are applicable to the evaluation of roller coaster rides. Peak head acceleration may yield less useful information than knowing the duration, direction(s) and both the linear and angular components of this head acceleration.

Relevant Standards Governing Amusement Rides

ASTM International

The nationally recognized standards for amusement rides are the American Society for Testing and Materials (ASTM) standards. ASTM was organized in 1898 and provides a management/administrative system for the development of voluntary, consensus standards. The technical committee on amusement rides safety standards (ASTM F-24) was established in 1978 and is presently made up of almost 400 individuals including manufacturers (20%), operators (35%) and general interest (45%). This committee develops new standards on an ongoing and as needed basis. Existing standards also are reviewed and updated every two years. As with most standards in the United States, ASTM standards become mandatory when cited in a contractual agreement or when referenced and mandated by a governmental body.

The ASTM standards for amusement rides actually consist of 14 separate standards covering issues such as design, operations, maintenance, quality control and testing. States typically adopt the ASTM standards making them law in that state and as more states adopt the same standards, they become the national standard. (See sections on State Regulations and Local Standards and Regulations.)

Acceleration limits for amusement rides are included in the ASTM standard Z9591Z "*Standard Practice for the Design of Amusement Rides and Devices.*" (The specific section of this standard that outlines acceleration limits is given in the Appendix A.)

The establishment of acceleration limits in amusement ride standards is relatively new (Europe first published acceleration limits in 1997), but designers and engineers have designed rides with purposely-limited accelerations for many years. The body of technical information available to designers and engineers includes general engineering principles, physical laws and commonly accepted acceleration limits. These acceleration limits, which are also the basis of the ASTM standard, are the outgrowth of 50 years of governmental research, university research, aerospace medicine and the work of other standards organizations around the world.

Engineering Standards

Roller coaster designers and engineers have backgrounds and training in various engineering disciplines. They are typically registered professional engineers with mechanical, civil, electrical and biodynamic engineering experience.

Because roller coasters are complex machines with exacting mechanical/structural requirements, they are designed using commonly accepted engineering practices and standards, the same standards that are used for designing aircraft, automobiles, bridges, skyscrapers, etc. Some of the standards that are referenced and required by the ASTM Z9591Z *'Standard Practice for the Design of Amusement Rides and Devices"* are detailed in Appendix B.

State Regulations

Most states that have amusement rides operating within their jurisdiction have enacted legislation that regulates their use. The ASTM standards are often adopted by the state and therefore become law in that state. According to the CPSC, approximately 42 states, which includes almost all states with fixed site amusement rides, have amusement ride regulations. Compliance in these states is typically monitored through the use of state ride inspectors and/or insurance inspectors.

Local Standards and Regulations

A fixed-site amusement ride must comply with local building codes before it can be constructed or operated. These codes include Building Officials Code Administrators International (BOCA), Uniform Building Code (UBC), Southern Building Code Congress International (SBCCI), National Fire Protection Association (NFPA) Life Safety Code, National Electrical Code (NEC) and others. The codes cover structural, mechanical, electrical and general occupancy/use standards and requirements. Compliance is monitored and checked by building and safety officials having jurisdiction.

Industry Self Policing

The U.S. amusement industry is more than a century old. It is an industry in which safety is not only a moral obligation, but also a prerequisite to doing business for without a safe environment, the industry would not exist. It is for these reasons that the industry has developed extensive and sophisticated systems of checks to insure the safety of their facilities. Amusement rides are designed, built, maintained and operated to exacting requirements. The common philosophy that runs through the industry is that "an amusement ride must be designed, constructed, installed, maintained and operated properly in order to consistently attract visitors;" thus, redundant and fail-safe designs are the norm for amusement rides.

The following steps are of paramount importance because they are recognized as crucial elements to the survival of the industry:

Several industry groups conduct extensive technical training and continuing education programs for park operating personnel. For example:

- The International Association of Amusement Parks and Attractions (IAAPA) sponsors safety seminars and workshops at convenient locations around the world and at the annual convention and trade show. In these seminars and workshops, the latest advances, standards and techniques are shared and discussed. IAAPA also produces safety training videos and other training materials that are used extensively by amusement park operators to train their staff. A major element of the IAAPA business plan is to keep its members abreast of new developments and foster communication between its member facilities.
- The National Association of Amusement Ride Safety Officials (NAARSO) has strict certification requirements for Certified Ride Inspectors. NAARSO conducts training and certification programs that enable qualified individuals to become certified amusement ride inspectors. This program includes training, testing and a continuing education program in a three-tier certification program.
- The Amusement Industry Manufacturers & Suppliers International (AIMS) conducts annual safety seminars and supplies expert speakers at industry functions. The AIMS Safety Seminar focuses on safety issues, technical training, new technology, maintenance and operations. AIMS also conducts an operations and maintenance certification programs at their annual safety seminars where candidates are tested on their knowledge in these areas. This program provides a formal system for certifying operating and maintenance staff through specific training and testing plans.
- Individual ride manufacturers and suppliers develop extensive operating and maintenance manuals for their equipment. These manuals include familiarization, orientation and training programs that buyers/operators may use to train their personnel. Many ride manufacturers also conduct on-site training programs specific to their equipment.
- Individual parks also utilize in-house developed and/or standardized training programs for their staff. These programs are designed to enhance worker knowledge and expertise by focusing on safety, reliability and preventative maintenance. Most in house programs include formal training and hands on experience under the supervision of experienced technicians.
- Common throughout the industry is a system whereby amusement rides are systematically inspected and checked by multiple work groups or disciplines. Checklists for daily, weekly, monthly and yearly inspections are common for most amusement rides.

Amusement Park Attendance

The U.S. amusement park community is comprised of approximately 450 parks. These parks range in size from major destination attractions with 15 million visitors per year to family owned parks with as little as 100,000 visitors per year. Total attendance (visitors) is estimated by several independent economic research and planning firms. In addition, *Amusement Business*, which is an amusement industry newspaper, tracks the attendance of the top 50 parks each year using proprietary sources including reported attendance, surveys and other measures. (The attendance in just these 50 parks was 174 million in 2001.) An outline of these statistics is listed in Table 1.

Common Misconceptions about Amusement Ride Accelerations

MISCONCEPTION #1 - *Ride designers have had a free reign, as there are no acceleration limits.*

Actually, there are published limits. The European Committee for Standardization (CEN) and the Technical Inspection Association (TUV) are European standards organizations that have published acceleration limits and the new ASTM standard Z9591Z "*Standard Practice for the Design of Amusement Rides and Devices* includes acceleration limits. These standards were based on many years of research, aerospace medicine and the work of standards organizations around the world.

Amusement rides are designed, analyzed, reviewed and approved by professional engineers the same as any structure in the United States and these professionals have always been conscious of acceleration effects through their education, training and experience. Today the design process for an amusement ride is an exacting process using computer aids and analysis techniques for developing and analyzing ride dynamics; nothing is taken for granted. Acceleration levels and other loads are well defined and analyzed before the ride is even built.

MISCONCEPTION #2 - *Rides today are higher and faster than ever, and the accelerations are getting out of hand.*

It is erroneous to believe that speed and height are the only attributes that determine acceleration levels on a roller coaster. Actually, the overall design of the roller coaster, i.e., the hills, valleys, curves, radius of curvature and speed determine the acceleration. Designers control all of these elements to produce a taller-faster roller coaster with the same or lower accelerations than older rides. For example, a roller coaster traveling at 50 mph going through the bottom of a vertical curve may generate 3 g's. If the speed of the roller coaster is increased to 100 mph and the vertical radius of curvature is increased by four times, the coaster will still generate only 3 g's. Thus, speed and height do not necessarily generate higher forces. In fact, high, fast and smooth rides may have substantially lower accelerations than some older, smaller and slower rides. Advances in technology, like computerized designs, computerized track rail bending and computer aided machining techniques have allowed taller and faster structures to be developed while keeping acceleration levels at or below previous levels.

MISCONCEPTION #3 - *Rides today have more acceleration than the Space Shuttle!*

The space shuttle has sustained accelerations in excess of 3 g's for several minutes. However, the 3-g space shuttle acceleration is in the +X (eyes back) direction. Most roller coasters and other amusement rides have their maximum sustained acceleration levels of 4 to 6 g's in the +Z (eyes down) direction and for much shorter periods. A comparison of the space shuttle to a roller coaster is like comparing apples and oranges. Actually very few amusement rides have a +X g level of more than the space shuttle's 3 g's. It also is important to understand that the space shuttle's levels were selected not entirely for the astronauts physical safety (most were ex fighter pilots who routinely pulled 7-9 g's in high performance aircraft); rather NASA determined through testing that at more than 3 g's, an astronauts psychomotor skills (ability to perform complex tasks) started to degrade. This requirement is not the case in amusement rides.

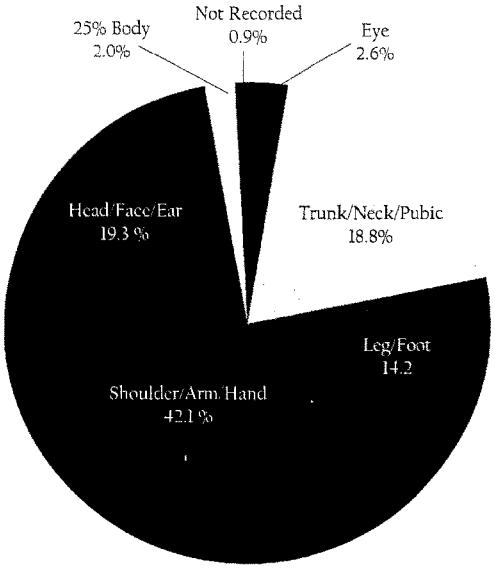
SAFETY RECORD

The United States Consumer Products Safety Commission (CPSC) tracks amusement park injuries that require medical attention at a hospital. This data indicates that the total of all injuries from all causes is approximately 6,500/year and the overwhelming majority of these are treated and released. Only about 130 people per year require an overnight stay. Therefore, the likelihood of being injured on a ride seriously enough to require hospitalization is about 1 in 25 Million.

Highlights of the CPSC 2002 Report along with injury rates are as follows:

Year	Injuries	Attendance (Million)	Injuries Per Million Visitors	Injuries Per Million Rides
1997	5,353	300	17.8	1.8
1998	6,523	300	21.7	2.8
1999	7,629	309	24.7	2.5
2000	6,595	317	20.8	2.1
2001	6,704	319	21.0	2.1

Injuries tracked by the CPSC are segmented into seven categories. The categories and their averages for 1997-2001 (shown above) is:



Note:
Percent of total may not sum to100 percent due to rounding.
Reported injuries include non-ride related injuries.

Assuming that all of the reported injuries in the trunk/neck/head/face/ear/pubic area occur on an amusement ride, which they do not, the percentage of injuries is still extremely low, i.e., »0.0000007% of rides result in an injury in these areas.

Commitment To Safety

It is clear that the amusement industry has an impressive safety record and that the industry strives constantly to strengthen its training, maintenance and testing programs. In addition, the industry abides by numerous state and local licensing and inspection regulations, adopts the latest technologies and techniques, and submits itself to regular rigorous insurance examinations. This commitment to safety has allowed the amusement industry to thrive for more than a century, and will ensure that it continues to provide safe, quality, family entertainment for many years to come.

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TABLES & APPENDICES

Table 1: Basic use statistics for amusement parks in the United States

Using information from all sources, the International Association of Amusement Parks and Attractions lists 2001 attendance as 319 Million. Other pertinent data can be summarized as follows:

Visitors	=	319 Million
Average Length of Stays	=	7 Hours
Total Visitor Time in Parks	=	2.24 Billion Hours
Average Rides	=	1.5/Hour
Average Rides Per Visitor	=	10
Total Rides Given	=	3.19 Billion

Appendix A: Acceleration Limits

(Section-7 of ASTM Z9591Z "*Standard Practice/Guide for the Design of Amusement Rides and Devices*")

7.1.1 Amusement rides and devices shall be designed such that the accelerations, as measured in accordance with ASTM F-2137, are within the limits specified in this practice.

7.1.2 Amusement rides and devices or major modifications that are designed to operate outside the acceleration limits herein shall include justification in the Ride Analysis. The justification shall include a review by a biodynamic expert.

7.1.3 Acceleration can vary greatly depending on the type and design of the amusement ride or device and the effect of these accelerations are dependent on many factors that may be considered in the design (see Appendix). Accelerations shall be coordinated with the intended physical orientation of the patron during the operating cycle. Rides and devices with patron containment systems shall be designed such that the patron is suitably contained and positioned to accept these accelerations. The Patron Restraint and Containment analysis shall consider cases related to patron position within the restraint as determined by the Designer/Engineer. Figure 4 illustrates the coordinate system utilized.

7.1.4 Sustained Acceleration Limits are shown in Figures 5, 6, 7, 8, and 9. The following definitions apply:

- Acceleration units are "g's" (32.2 ft/sec/sec or 9.81 m/sec/sec).
- The limits are based on low pass filtered data with a cutoff frequency of 5 Hz. The filter to be applied shall be either a 2 pole Butterworth applied in both the forward and reverse directions, or a 4 pole Butterworth applied in the forward direction conforming to SAE J 211. Cutoff frequency is defined to be that frequency where the magnitude response of the filter is the square root of ½.
- Impacts of less than 200 milliseconds duration with accelerations greater than 6 g are not addressed by this Practice.

- Acceleration limits herein are for patrons 48 inches in height and above. The Designer/Engineer shall determine whether more restrictive limits are appropriate for an amusement ride or device that accommodates patrons under 48 inches in height. In making this determination, the Designer/Engineer shall consider biodynamic effects on the patrons. If an amusement ride, device, or major modification that accommodates patrons under 48 inches in height is designed to operate outside the acceleration limits herein, the Ride Analysis must include a review by a biodynamic expert.
- Because of insufficient data, the suitability of the acceleration limits herein for disabled patrons must be addressed on an individual basis.
- The coordinates and measurement point for the acceleration limits are in accordance with ASTM F 2137-01 Section 12 "Standardized Amusement Ride Characterization test (SARC test)."
- The limits specified for all axes are for total net acceleration, inclusive of earth's gravity. A motionless body would therefore have a magnitude of 1 g measured in the axis perpendicular to the earth's surface, and a zero g magnitude in the axes parallel to the earth's surface.
- Steady state values in the charts are not limited in time unless otherwise specified. Sustained exposure in excess of 90 seconds has not been addressed by this practice.
- These limits are provided for the following basic restraints types:
    - Base Case (Class-4 or 5 Restraint)- For the purpose of acceleration limits, the class 4 restraint used as the base case herein also provides support to the lower body in all directions and maintains patron contact with the seat at all times.
    - Over-the-Shoulder (Class-5 Restraint)
    - Prone Restraint- A prone restraint is one in which the patron is oriented face down at a point or points during the ride cycle. A prone restraint is a restraint designed to allow the patron to accept higher acceleration in the –Gx (eyes front) as compared to the Base Case and Over-the-Shoulder restraints.

The Patron Restraint and Containment Analysis shall be used to determine the type of restraint. The type and performance of the restraint system selected may require a reduction in the acceleration limit.

Figure 4 Coordinate System

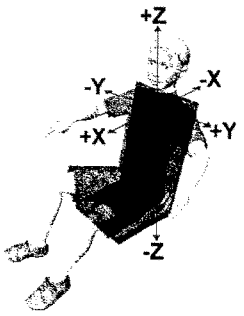


Figure 5 Time Duration Limits for $+G_x$ (Eyes Back)

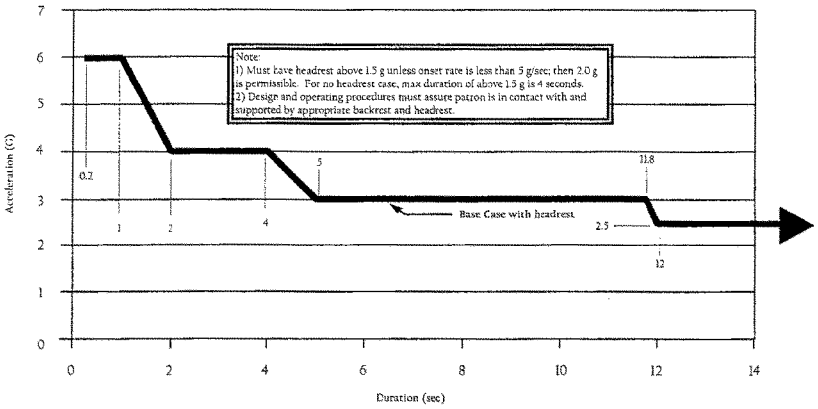


Figure 6 Time Duration Limits for $-G_x$ (Eyes Front)

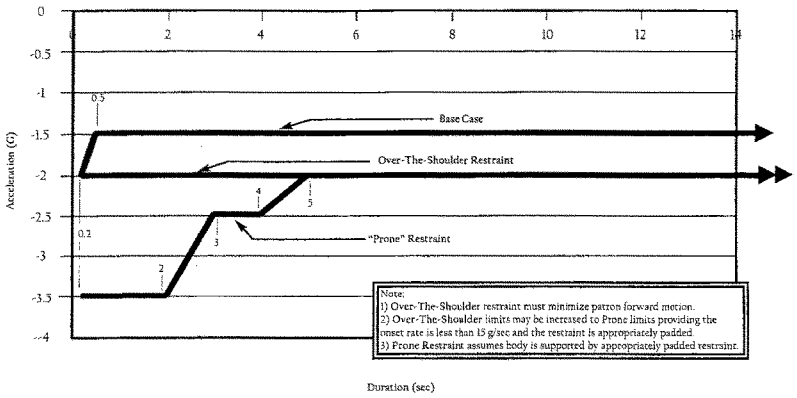


Figure 7 Time Duration Limits for +/-Gy (Eyes Left or Eyes Right)

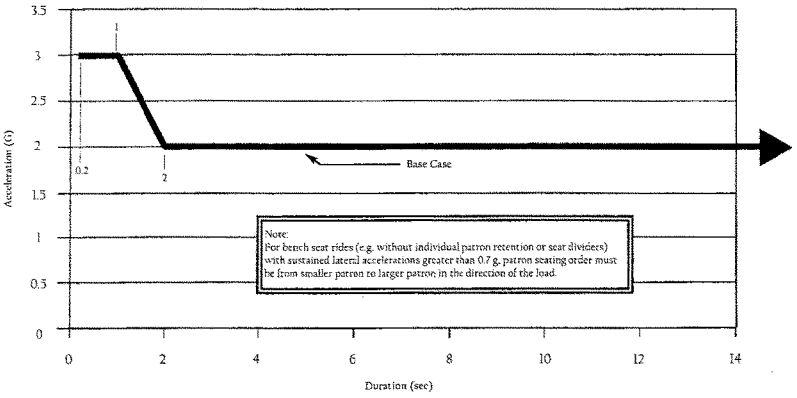


Figure 8 Time Duration Limits for -Gz (Eyes Up)

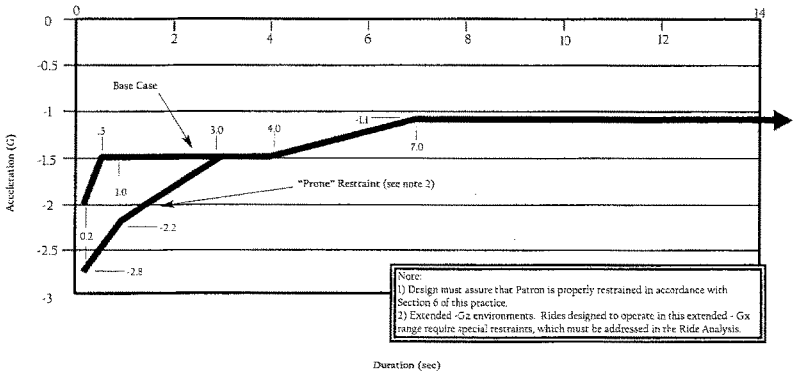
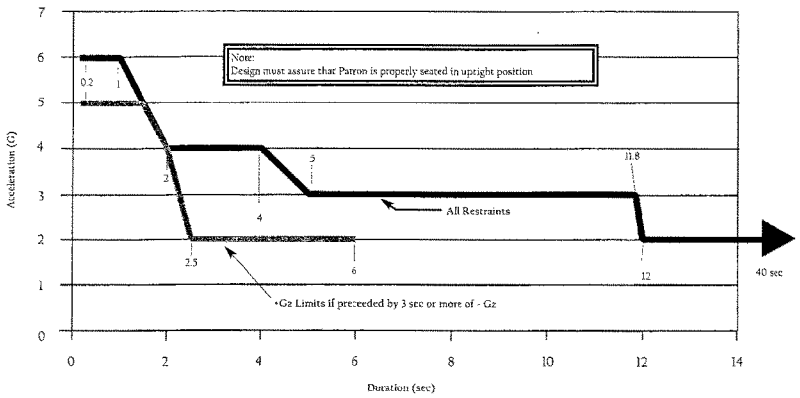


Figure 9 Time Duration Limits for +Gz (Eyes Down)



7.1.5 Simultaneous combinations of single axis accelerations shall be limited as follows:

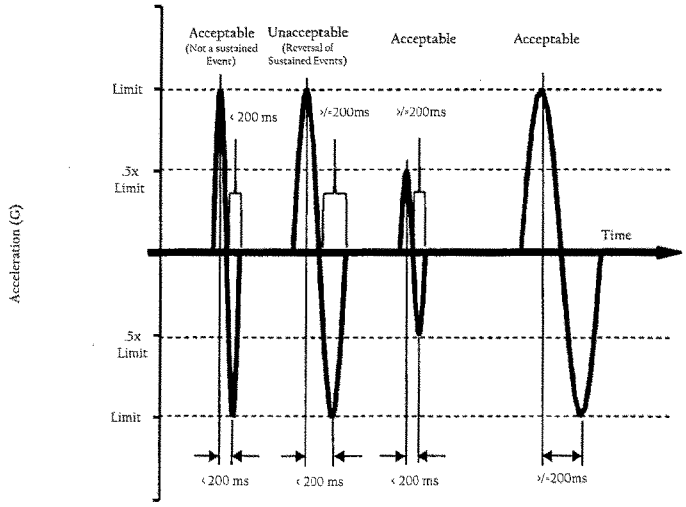
7.1.5.1 The instantaneous combined acceleration magnitude of any two axes shall be limited by a curve that is defined in each quadrant by an ellipse. The ellipse is centered at (0,0) and is characterized by major and minor radii equal to the allowable 200 millisecond G limits x 1.1. Graphical representations of this requirement are presented in the Appendix for clarification. Note that for a given ride, only three of the curves will apply.

7.1.6 Reversals in X and Y accelerations are shown in Fig. 7. The following criteria shall apply:

7.1.6.1 The peak-to-peak transition time between consecutive sustained events in X and Y accelerations shall be greater than 200 ms, as measured by the time between the peaks of the consecutive events. When the elapsed time between consecutive sustained events is less than 200 msec, the limit for the peak values shall be reduced by 50%.

7.1.6.2 The following examples illustrate such reversal:

Figure 10 Reversals in X and Y (5 Hz Filtered Data)

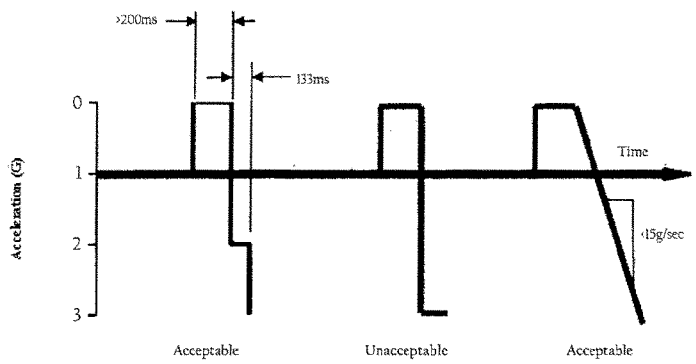


7.1.7 Transitions in Z

7.1.7.1 Transition directly from negative (eyes up) limits to positive (eyes down) limits is restricted. If Patrons are exposed to a negative Gz environment for more than 3 seconds, then the limits are reduced as shown in the +Gz limit chart for 6 seconds after the transition to positive Gz. After the 6 second period, the limits may be increased to the normal chart levels.

7.1.7.2 Other Transitions in Z accelerations are shown in Fig. 8. The following criteria shall apply: When transitioning from sustained weightless (0g) and more negative levels to 2g's and more positive levels, the effective onset of positive g's shall be less than 15 g's/sec. The following example illustrates such transitions:

Figure 11 Transitions from Sustained -Gz (eyes up) to +Gz (Eyes Down) (5 Hz Filtered Data)



Measurement and analysis of acceleration on amusement rides and devices shall be performed in accordance with ASTM F-2137-01, *Measuring the Dynamic Characteristics of Amusement Rides and Devices.* The design acceleration levels of the final operational assembly of a newly developed amusement ride, device, or major modification shall be verified at commissioning. The Manufacturer may verify acceleration limits herein by using either manual (e.g., graphic, hand calculations, etc.) or automatic (e.g., computational, computer, etc.) procedures.

Appendix B: Additional standards references and required by ASTM Z9591Z

"Standard Practice for the Design of Amusement Rides and Devices"

- ASTM (American Society for Testing and Materials):
  - ASTM F-698-94 (R2000) Specification for Physical Information to be Provided for Amusement Rides and Devices.
  - ASTM F-747-97 Terminology Relating to Amusement Rides and Devices.
  - ASTM F-770-93 (R2000) Practice for Operation Procedures for Amusement Rides and Devices.
  - ASTM F-846-92 (R1998) Guide for Testing Performance of Amusement Rides and Devices.
  - ASTM F-853-98 Practice for Maintenance Procedures for Amusement Rides and Devices.
  - ASTM F-893-87 (R2000) Guide for Inspection of Amusement Rides and Devices.
  - ASTM F-1159-02 Practice for the Design and Manufacture of Amusement Rides and Devices
  - ASTM F-2137-01 Practice for Measuring the Dynamic Characteristics of Amusement Rides and Devices
  - ASTM STP-1330-98 Composite Materials: Fatigue and Fracture, 7th Volume
  - ASTM MIL 17 -99 The Composite Material Handbook
- ACI (American Concrete Institute):
  - ACI-301-99 Specifications for Structural Concrete
  - ACI-318-02 Building Code Requirements for Structural Concrete (ACI-318-99) and Commentary (318R-99)
- AFPA (American Forest & Paper Association), American Wood Council Publications:
  - NDS (National Design Standard) for ASD Design
- AISC (American Institute of Steel Construction):
  - AISC 316 Manual on Steel Construction, Allowable Stress Design (ASD), 1989
  - AISC M015 Manual on Steel Construction, Load & Resistance Factor Design (LRFD), 1986
- ANSI (American National Standards Institute):
  - ANSI B93.114M 1987 Pneumatic Fluid Power – Systems Standard for Industrial Machinery
  - ANSI B11.TR3 2000 Risk Assessment and Risk Reduction – A guide to Estimate, Evaluate, and Reduce Risks Associated with Machine Tools
  - ANSI B77.1 1999 Passenger Ropeways – Aerial Tramways, Aerial Lifts, Surface Lifts, Tows and Conveyors – Safety Requirements
  - ANSI 2193
- ASCE (American Society of Civil Engineers):
  - ASCE 7-95 Minimum Design Loads For Buildings and Other Structures
  - ASCE 16-95 Standard for Load and Resistance Factor Design (LRFD) For Engineered Wood Construction.

- ASMI (American Society of Metals International):
  ASM Atlas of Fatigue Curves, 1986
  ASM Handbook Volume 19: Fatigue and Fracture
- ASME (American Society of Mechanical Engineers):
  ASME B15.1-00 Safety Standards for Mechanical Power Transmission Apparatus
  ASME A17.-02 Safety Code for Elevators and Escalators
- AWS (American Welding Society):
  ANSI/AWS D1.1/D1.1M-2002 Structural Welding Code-Steel
  ANSI/AWS D14.4 –1997 Specification For Welded Joints In Machinery and Equipment
- British Standards Institution:
  BS 5400-10(1980) Steel, Concrete and Composite Bridges. Code of practice for Fatigue
  BS 7608(1993) Code Of Practice For Fatigue Design And Assessment Of Steel Structures
- CDC (Center for Disease Control):
  CDC Basic Body Measurements (http://www.cdc.gov/ [Search:anthropometrics])
- CISC (Canadian Institute of Steel Construction):
  Hallow Structural Section Connection and Trusses- A Design Guide, J.A. Parker and J.E. Henderson
- DIN (German Institute For Standardization):
  DIN 15018-1, Cranes; steel structures; Verification and Analyses date
- EN (European Committee for Standardization):
  EN 280 2001 Mobile Elevating Work Platforms – Design Calculations, Stability Criteria, Construction, Safety, Examinations, and Tests
  EN 954-1 96 Safety of Machinery – Safety Related Parts of Control Systems – General Principles for Design
  EN 1050 96 Safety of Machinery – Principles for Risk Assessment
  EN 1993-1-9:2001 Eurocode 3. Design of steel structures. Part 1.9. Fatigue strength of steel structures.
  EN 1993-1-9:2001 Eurocode 3. Design Of Steel Structures. Part 6.9. Crane Supporting Structures - Fatigue Strength.
  EN 60204-1: 1998 Safety of Machinery – Electrical Equipment of Machines – General Requirements
  EN 60947-1: 1999 Low-Voltage Switchgear and Controlgear
  EN 61496-1: 1999 Safety of Machinery – Electro-Sensitive Protective Equipment – General Requirements and Tests
- IEC (Cable Assemblies Interface Equipment):
  IEC-60204-1: 2000 Safety of Machinery – Electrical Equipment of Machines – Part 1: General Requirements
  IEC-61508-1: 1999 Functional Safety of Electrical/Electronic/Programmable Electronic Safety-Related Systems – General Requirements

- Federal Documents:
  USDA -72 (US Dept. of Agricultural) The Wood Handbook - Wood As An Engineering Material, Forest Service, Forest Products Laboratory date.
- ISO (International Standards Organization):
  ISO 4414 2ED 98 Pneumatic Fluid Power General Rules Relating To Systems
- NEMA (National Electrical Manufacturers Association):
  NEMA 3R pg 62
- NFPA (National Fire Protection Agency):
  NFPA/JIC T2.25.1M-1986 Pneumatic Fluid Power – Systems Standard for Industrial Machinery
  NFPA-79-1997 Electrical Standard for Industrial Machinery
  NFPA-70-2002 National Electric Code (NEC)
  NFPA 101 2000 Life Safety Code
- IPEEC (International Organization for the Study of Endurance of Wire Rope)
- SAE (Society of Automotive Engineers)
  SAE J-211 PT195 Instrumentation for Impact Test – Electronic Instrumentation
  SAE J-833 89 Human Physical Dimensions
  SAE HS 4000: 1999 Fastener Standards
- UL (Underwriter's Laboratory):
  UL 508: 2000 Industrial Control Equipment
  UL-508A: 2000 Industrial Control Panels
- Other Referenced Publications:
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  Humanscale 7/8/9, Henry Dreyfuss Associates, The MIT Press, 2nd printing 1991
  Mechanical Engineering Design, Joseph E. Shigley & Larry D. Mitchell, McGraw-Hill
  Standard Handbook of Machine Design, Joseph E. Shigley & Charles R. Mischke, McGraw-Hill
  Handbook of Mechanical Engineering, Heinrich Dubbel, Wolfgang Bietz, K.H. Kuttner, Springer-Verlag
  Fatigue Strength of Welded Structures, S.J. Maddox, 2nd Edition, Abington Publishing, 1991

Appendix C: Roller Coaster Evolution

Year & Milestone	Description
1400's First Coasters	The first known records date back to Russia in the 1400's when slides constructed of wood were covered with ice and people would climb into an ice-block sled outfitted with a straw seat for a swift but enjoyable ride to the bottom. By the 16th century, elaborate ice slides were built in St. Petersburg, Russia. These slides were about 70 feet high and often stretched for several blocks. Riders had to climb a long set of stairs to the top in order to ride. Later, some slides used more comfortable 2-foot long sleds instead of ice blocks. This was strictly a winter activity for without ice they did not work.
1784 First Wheeled Coaster Cars	Catherine the Great added small wheels to her ice sled to extend the riding season. This feature made the slide concept more attractive in climates where building an ice slide was not a desirable option.
1816 First Coasters Outside of Russia	Dry slides with wheeled carts were erected in Paris Many were named for the Russian ice slides, "Les Montagnes Russe", which means Russian Mountain. One design used hundreds of rollers on the slide and sleds with runners coasted down the slide on the rollers. (This may be the origin of the term roller coaster.)
1848 First Looping Coaster	French engineer Monsieur Clavieras opened the world's first looping coaster, the "Centrifugal Pleasure Railway" at the Frascati Gardens in Paris. The ride started from a 43-foot high hill and had a 13-foot diameter loop. It worked but with the small circular loop the strain was too much on passengers. The coaster was deemed unfeasible and was soon torn down.
1873 First U.S. Coaster	In the United States, a gravity-powered transportation system for moving coal was developed in Mauch Chunk, Pennsylvania. This 18-mile long circuit was made obsolete by the construction of a nearby tunnel that provided a new route for the coal. The owners decided to put a passenger car on the line and began hauling paying customers instead of coal. The round-trip was approximately an hour and a half. The owners charged one dollar per ride and the venture was a success, demonstrating that people would pay money to coast down a hill.
1884 First Real Coaster Father of Gravity	La Marcus Adna Thompson opens the first true roller coaster at Coney Island in New York City on June 13, 1884. Thompson's "Switchback Gravity Pleasure Railway" was partly a Russian Mountain and partly the Mauch Chunk Railway. He charged five cents to ride and recouped his cost in less than three weeks. By 1888, Thompson had built twenty roller coasters in the United States and twenty-four in Europe earning him the nickname of "Father of Gravity."
1884 First Continouus Circuit Coaster	Charles Allcoke builds the first continuous-circuit roller coaster at Coney Island. The design allows riders to end up where they started.

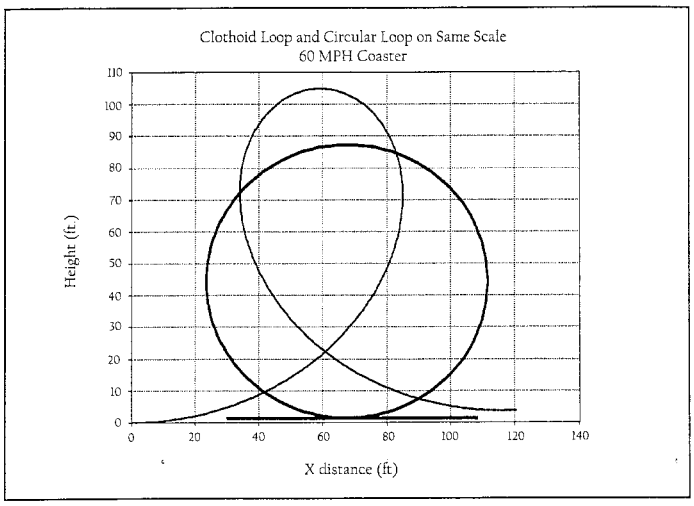
Year & Milestone	Description
1885 First Mechanized Lift System	Philip Hinkle builds a roller coaster where the seats face forward and the cars are mechanically pulled to the high point (lift hill) with a steam powered winch system. Variations on this design have been used on practically every roller coaster since 1885.
1887 First Figure Eight Coaster	First "Figure-Eight" roller coaster built at Haverhill, Massachusetts.
1891 First Switchback Coaster in England	First "Switchback Railway" built at Blackpool, England.
1891 Second Looping Coaster	Lina Beecher invents and markets the vertical looping "Centrifugal Cycle Railway".
1895 First Looping Coaster in the U.S. Opens	Lina Beecher's looping roller coaster the "Flip Flap" opens at Coney Island New York. The ride had a 25-foot circular loop and riders went through it so fast that a force equivalent to 12 g's was generated. Although uncomfortable and dangerous, the 25-foot circular loop proved popular. However, after many complaints of neck and back injuries, the Flip Flap was closed, having operated for only a few years.
1895 First Park to Charge Admission	Paul Boyton's Sea Lion Park opens at Coney Island. Considered to be the first enclosed amusement park with a gate admission.
1901 First Successful Looping Coaster	Edmund Prescott opens the first successful vertical-looping roller coaster. The "Loop-the Loop" was engineered with a much smoother elliptical loop vs. the Flip Flap circular loop. The ride attracted national attention when a glass of water strapped to a seat went through the loop without spilling a drop. Although the elliptical loop was a tremendous engineering feat, the ride closed within a short time as it did not meet three rules: large seating capacity, repeat riders and a death-defying appearance.
1907 First High Speed Roller Coasters	The first high-speed roller coaster, "Drop-the-Dips", designed by Christian Feuchs opens at Frederick Ingersoll's Luna Park in Pittsburgh, Pennsylvania. This was the first roller coaster to incorporate "lap bars" to secure riders in their seats. It was around this time that the roller coaster became the main attraction at amusement parks, which it remains today.

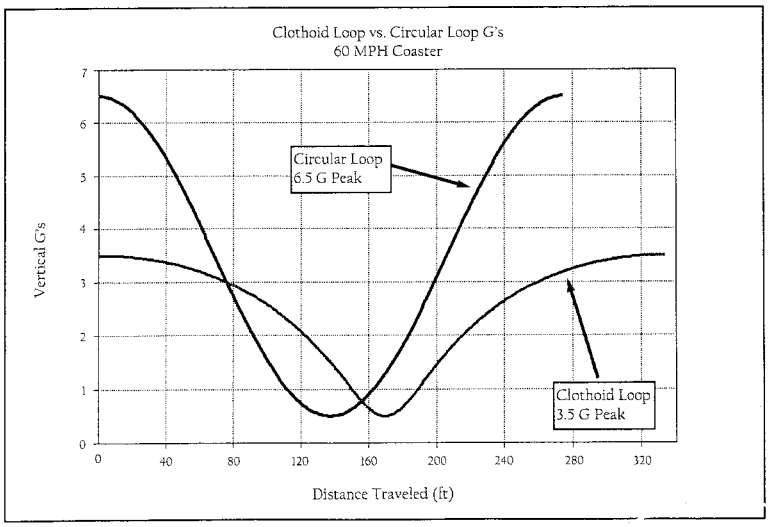
Year & Milestone	Description
1922 Uplift and Guide Wheels Invented	John Miller patents the "uplift wheel" and "guide wheel" safety systems for coaster cars. The uplift wheel keeps the cars on the track and allows roller coaster designers to develop more thrilling rides.
1920's The Golden Age of Roller Coasters	The first "golden age" of the roller coaster. Over 1,500 roller coasters are operating in North America and another 1,500 to 2,000 overseas. Local trolley companies are credited with the building craze when they build amusement parks at the end of the trolley line to entice trolley riders on weekends.
1930's The Demise of the Roller Coaster	The Great Depression causes many parks to close. Parks were torn down, classic roller coasters demolished and lack of maintenance encouraged fires and other failures that caused the number of roller coasters to dwindle rapidly. During the period from 1930 to 1972 almost 1,500 roller coasters were torn down and only 120 were built. July 28, 1934 - Streetcar service to Summit Beach Park, Akron, Ohio ends.
1952 Revival of the Roller Coaster	Cinerama film revives interest in roller coasters.
1959 First Steel Track Roller Coaster	Karl Bacon and Arrow Development builds the first steel track roller coaster. The "Matterhorn Bobsleds" opens at Disneyland on June 14, 1959.
1970's Second Golden Age of Roller Coasters	The second "golden age" of the roller coaster. By 2002, there are approximately 670 roller coasters in North America and about 1,600 worldwide. The other major locations are Europe with 460 and Asia with 359.
1972 Twin Track Wooden Coaster	John Allen of Philadelphia Toboggan builds a twin-track wooden roller coaster at Kings Island in Cincinnati, Ohio. "The Racer", kick-started a great revival in classic wooden coasters.
1975 First Corkscrew Roller Coaster	Ron Toomer of Arrow Development designs the first loop-the-loop corkscrew roller coaster, the "Corkscrew" coaster at Knotts' Berry Farm in Buena Park, California.
1976 First Modern Vertical Loop Coaster	Anton Schwarzkoph designs the first modern day "vertical-loop" steel coaster. "The Great American Revolution" commonly called "The Revolution" opens at Six Flags Magic Mountain in Valencia, California.

Year & Milestone	Description
1979 Longest Wooden Coaster	"The Beast", the longest wooden-track roller coaster in the world is built at King Island in Cincinnati, Ohio. The Beast is 7,400 feet long with two lift hills.
1981 First Suspended Coaster	Arrow Development designs the first suspended roller coaster for Kings Island in Cincinnati, Ohio. "The Bat" with its suspended-swinging cars opens to much acclaim. This design, which allows the cars to swing to align with the centrifugal force, provides almost perfectly banked curves.
1984 First Stand-Up Coaster	Togo of Japan builds the first "stand-up" roller coaster at Kings Island in Cincinnati, Ohio. Riders stand, resting on unicycle type seats, with elaborate restraints to ride a looping roller coaster standing up.
1989 First Coaster over 200 Feet	Arrow Development builds the first mega-coaster, "Magnum XL 200", at Cedar Point in Sandusky, Ohio. It has the highest lift hill at 205 feet and longest first drop at 195 feet.
1992 First Inverted Coaster	Bolliger & Mabillard builds the first "inverted" roller coaster, "Batman The Ride", at Six Flags Great America in Gurnee, Illinois. This roller coaster featured inverted vehicle (track on top), feet dangling (no vehicle body) and outside loops (vehicle on outside of loop). Current amusement rides of all types copied the open feeling provided by this design.
1992 Longest Coaster	The world's longest roller coaster, "Ultimate" is built at Lightwater Valley Theme Park, England. The wooden roller coaster is 7,442 feet long with a height of 157 feet.
1994 Record Holder	"Desperado", built by Arrow Dynamics at Buffalo Bill's Resort Casino, becomes the world's tallest roller coaster at 209 feet. It is also the fastest conventional gravity ride at 80 MPH and has the longest first drop or 225 feet.
1995 Most Inversions	"Dragon Khan" designed by Bolliget & Mabillard of Switzerland opens at Port Aventura, Salou, Spain. Dragon Khan has the most inversions of any complete circuit roller coaster, a total of eight.
1996 Tallest Coaster	"Fujiyama", built by Togo of Japan at Fujikyp Highlands Park, Japan, became the world's tallest roller coaster at 259 feet above ground and had the highest lift hill of 234 feet 7 inches.

Year & Milestone	Description
1997 Tallest Coaster	"Superman: The Escape", designed by Intamin AG of Switzerland, opens at Six Flags Magic Mountain, and is the first roller coaster powered by linear motors. Linear motors catapult the vehicles up to 100 MPH after which it travels up a vertical track 400 high then retraces its path backwards. The ride has a straight track, no turns or loops, with large radius between the horizontal and vertical track that keeps accelerations at approximately 3.5 g's. The 400-foot tower also produces a floating experience (zero G's) for approximately seven seconds.
1998 Steepest Drop	"Oblivion", Designed by Bolliger & Mabillard of Switzerland opens at Alton Towers, England. It is the first "vertical drop" roller coaster
2000 Tallest Coaster	"Millennium Force", opens at Cedar Point in Sandusky, Ohio as the new world's tallest roller coaster. It is 310 feet high with a first drop of 300 feet. (With a modern high tech design Millennium Force has lower forces than some older and smaller roller coasters.)
2002 Flying Coaster	"Superman: Ultimate Flight" opens at Six Flags Over Georgia in Atlanta, Georgia. Built by Bolliger & Mabillard of Switzerland, this high tech roller coaster positions riders in a lay-down position, which simulates the thrill of flying. (Extensive simulator testing, prototype testing, analysis and subsequent test rides proves the concept is not only feasible but highly desirable.)
2002 Statistics	Today there are approximately 1,600 roller coasters worldwide. Most of these are in North America (679), Europe (460) and Asia (359).

Appendix D: Clothoid vs. Circular - 60 mph Coaster
Modern designs reduce acceleration levels





Appendix E: Brain Injury Association of America

Mission Statement:
To create a better future through brain injury prevention, research, education and advocacy.

Contact Information:
105 North Alfred Street
Alexandria, VA 22314
(703) 236-6000
www.biausa.org

Background:
Each year, at least 1.5 million Americans sustain a traumatic brain injury (TBI) resulting in more than 4,000 individuals sustaining a TBI on a daily basis. One million people are treated and released annually from hospital emergency rooms after sustaining a brain injury. Brain injury claims more than 50,000 lives and leaves more than 80,000 individuals with lifelong disabilities each year. The "silent epidemic" of brain injury is illustrated best by a 1999 statistic from the Centers for Disease Control and Prevention (CDC)-there currently are at least 5.3 million Americans living with a disability as a result of brain injury.

With traumatic brain injury occurring every 21 seconds, this public health concern ranks as the leading cause of death and disability in children and young adults. For those who survive and their families, brain injury is life altering. Serious physical impairments are a frequent result, as are a variety of cognitive, behavioral and emotional complications. In addition, the costs related to brain injury are staggering. Individuals with severe brain injury typically face five to 10 years of intensive rehabilitation with cumulative costs exceeding $35 billion annually.

The Brain Injury Association of America was founded in 1980 by a group of individuals who wanted to improve the quality of life for their family members who had sustained brain injuries. Despite phenomenal growth over the past two decades, the Association remains committed to its grassroots. The Brain Injury Association of America encompasses a national network of more than 40 chartered state affiliates across the country, as well as hundreds of local chapters and support groups.

The Association envisions a world where all preventable brain injuries are prevented, all unpreventable brain injuries are minimized and all individuals who have experienced brain injury maximize their quality of life.

By acting as a clearinghouse of community service information and resources, participating in legislative advocacy, facilitating prevention awareness, hosting educational programs and encouraging research, the Brain Injury Association of America and its affiliates work to reach the millions of individuals living with the "silent epidemic" of brain injury.

The Brain Injury Association of America's Family Helpline receives approximately 15,000 calls each year from individuals with brain injury, family members and providers seeking assistance, education and support. The Family Helpline is, for many, the first point of contact and support during the tumultuous times following a brain injury. The trained Information and Resources Department, who manages the Family Helpline, provides resources to individuals involved in brain injury.

All of the Association's chartered state affiliates deliver core services in their communities, including education, advocacy, support and prevention. The affiliates act as a clearinghouse of information and resources, often available to callers through statewide, toll-free family helplines. One of the Brain Injury Association of America's goals is to provide individuals with information that will assist them in being their own best advocates.

Additionally, the Association spearheads a network of information exchange through its collaboration with the Defense and Veterans Brain Injury Center (DVBIC). A number of publications emanate from this partnership, including TBI Challenge!, a newspaper geared toward those affected by brain injury and Brain Injury Source, a professional magazine. The Association also educates its constituents with the Brain Injury Resource Center™ (BIRC™), an interactive, computer-based, multimedia system, as well as its Web site - biausa.org - geared toward those affected by brain injury.

The Brain Injury Association of America provides comprehensive education about brain injury to audiences as diverse as physicians, rehabilitation specialists, trial lawyers and educators. Conferences such as the National Symposium and the Public Policy Conference, as well as state and local seminars, feature best practices in the field presented by leading experts.

Currently, prevention is the only known cure for brain injury. Through programs geared to all age levels, the Association devotes a great deal of effort toward teaching children and adults how to prevent brain injuries from occurring. The Brain Injury Association of America represents its interest in brain injury prevention through participation in national coalitions, including the SafeUSA Planning Council, the Healthy People 2010 Consortium and the National Highway and Transportation Safety Administration's (NHTSA) national Bicycle Safety Network. Fact sheets and current information on brain injury prevention are provided on the Association's Web site.

The Brain Injury Association of America's Government Relations Department is strongly committed to advocating at the Federal, state and local levels of government on behalf of individuals with brain injury and their families. Chief among the Association's legislative victories was the 1996 passage of the Traumatic Brain Injury Act, which was reauthorized by Congress in October 2000. The Brain Injury Association of America participates in a number of disability-related coalitions and has played an important role in the passage of legislation as diverse as the Workforce Incentives Improvement Act and the Assistive Technology Act, while working to prevent the erosion of the Individuals with Disabilities Education Act, which protects the constitutional rights of children and adults with brain injury.

The Brain Injury Association of America is proud to be the only nonprofit organization working on behalf of individuals with brain injury and their families. The Association recognizes the tireless accomplishments of its constituents across the country-from individuals with brain injury, medical professionals and family members to educators, attorneys and corporate partners. Much of the Association's success is due to the support of these courageous people.

Appendix F: Blue Ribbon Panel Members

Gregory O'Shanick, M.D.
Chair
National Medical Director
Brain Injury Association of America
Alexandria, VA
Medical Director, Center for
Neurorehabilitation Services
Midlothian, VA

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David A. Hovda, Ph.D.
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of Molecular and Medical Pharmacology
Director, UCLA Brain Injury Research
Center
Los Angeles, CA

T. Harold Hudson
Industry Expert
(Retired Sr. Vice President of Engineering,
Six Flags Theme Parks, Inc.)
President
AAPRA Associates, LLC
Southlake, TX

Y.King Liu, Ph.D.
President
University of Northern California
Petaluma, CA

David Meaney, Ph.D.
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University of Pennsylvania
Philadelphia, PA

Nils Roberts Varney, Ph.D.
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Chief, Psychology Service
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Iowa City, IA

Please see kit for biographical sketches

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