

**PIERCE COUNTY  
HAZARD IDENTIFICATION & RISK ASSESSMENT  
TRANSPORTATION ACCIDENTS HAZARD**

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# Identification Description

## Definition

Transportation accidents as used in this assessment include accidents involving a method of transportation on the road, rail, air, and maritime systems within the confines of Pierce County.

## Types

Small accidents between a small number of motor vehicles, small watercraft or an accident involving a small private plane are not included in this definition. Instead, accidents must involve a level of complexity that taxes first responder systems or triggers the activation of the mass casualty incident plan, mass fatality incident plan or response to violence plan. Since hazardous materials are covered in the Hazardous Materials chapter, this chapter, while mentioning it as contributing factor, will not emphasize it.

- Road Transportation:** Pierce County is traversed by eleven state highways, one interstate with a short interstate feeder into downtown Tacoma, and numerous roads and streets.

- Rail Transportation:** Passenger, freight and tourist rail lines exist in various places in Pierce County. This includes Burlington Northern Santa Fe (BNSF) Railroad, Fort Lewis Rail, Sound Transit, Tacoma Rail, Tacoma Rail Mountain Div., and Union Pacific Railroad.

- Air Transportation:** Pierce County is home to thirteen working airports. (See Table TA-1 Airports in Pierce County.) Air traffic consists of private fixed wing, sea planes, small commercial jets, helicopters and a large contingent of military aircraft.

- Maritime Transportation:** The Port of Tacoma is a major terminus for commercial vessels. Ships also traverse the western portions of the County en route to and from Olympia. Ferry routes cross between Steilacoom and McNeil, Anderson, and Ketron Islands. Vashon Island has a Washington State Ferry route that runs between Point Defiance and Tahlequah on its southern end. A small private ferry runs between the Longbranch Peninsula and Herron Islands. Commercial tour boats spend time in Pierce County waters as do hundreds of private boats of all types and sizes.

Table TA-1 Airports in Pierce County		
Airport	Location	Owner, Use
Gray Field	Joint Base Lewis/McChord	US Army - Military
McChord	Joint Base Lewis/McChord	US Air Force - Military
Thun Field	S. of Puyallup	Pierce County - Flight Training, Lt. Jet Traffic, Helicopter, Commercial, Charter
Tacoma Narrows	Gig Harbor	Pierce County - Flight Training, Charter, Lt. Jet Traffic, Helicopter, Commercial
Spanaway	Spanaway	Public
American Lake Seaplane Base	Lakewood	Seaplane
Swanson	Eatonville	Public
Kapowsin Field	Kapowsin	Private
Mt. Rainier, Kautz	Kautz Creek	Federal - Helicopter
Fitz Pad 2 Heliport	Graham	Private - Helicopters and single engine planes.
Shady Acres	Spanaway	Private
Cawleys South Prairie	South Prairie	Community
Burnett Landing Airport	Wilkeson	Private

# Profile

## Location and Extent

The various forms of transportation, covering the majority of the County have considerable potential for accidents that could threaten Pierce County's infrastructure, its citizens and their livelihood.

- **Road Transportation:** Privately owned vehicles and local bus services provide the primary means of transportation for individuals in Pierce County. Freeways, highways and roads serve the area. Important roadways include Interstate 5, State Highways 16, 123, 161, 162, 163, 167, 410, 509, and 512. All major highways carry high volumes of traffic, including large numbers of commercial vehicles carrying goods, and in some cases hazardous materials. Transit, school buses, and even bicyclists (including marathons) also use these roads. A major road transportation emergency could be caused by an accident involving any one of these carriers. Generally, most traffic accidents, even when a death occurs, are considered routine and not a major incident. The type of situations where an incident could be considered major might involve an Amtrak train landing on the I-5; or a bus of school children; a semi-truck losing brakes and plowing into businesses; or, a semi-truck carrying hazardous materials exploding in rush hour traffic. If carrying hazardous materials, surrounding areas could require sheltering in place or evacuation, as necessary.
- **Rail Transportation:** The rail lines run through the County and through or near the edges of DuPont, Steilacoom, Lakewood, University Place, Tacoma, Fife, Puyallup, Sumner, and Bonney Lake. Passenger transportation exists in Pierce County in the form of Amtrak, the Sounder, and Tacoma Link. Amtrak follows the tracks along Puget Sound north of the Nisqually River to Point Defiance, then through Tacoma and Puyallup and up the Auburn Valley. Sound Transit provides weekday service and covers special events on the Sounder between Lakewood and Everett and the Tacoma Link between Tacoma Dome and Theater District. Burlington Northern/Santa Fe and the Union Pacific have lines which run north and south through the County. The railroad owned by the City of Tacoma transports goods and materials around the Port of Tacoma. It also operates the 132 miles of line out to Fredrickson and south out of the County to Morton and Chehalis. The Mt. Rainier Scenic Railway, a small privately-owned tourist rail line, runs from Elbe up the Nisqually River valley and then south along Mineral Creek to Mineral Lake in Lewis County.
- **Air Transportation:** The fourteen active airports or airstrips in Pierce County range tremendously in size and use. At one end of the scale there are McChord and Gray Fields, both major US military facilities. At the other end of the scale there are small fields like Spanaway and Ranger Creek or the heliport at Kautz Creek in Mt. Rainier National Park. Aircraft come and go from some of these small runways daily, while others have more casual use. Many of the smaller airports in the County were built in rural areas with low population. Over the years, as the County's population base expanded, many of these have now become part of the suburban landscape, surrounded by neighborhoods and businesses.

Pierce County owns two small commercial airports, Thun Field and the Tacoma Narrows Airport. Pierce County has the added risk of being directly in the flight path for many planes either landing or taking off from Sea-Tac International Airport in King County.

- **Maritime Transportation:** Marine transportation accidents can be classified into two types: those that directly involve large numbers of people in a potential mass casualty accident such as a ferry sinking, or those that threaten the larger community or the environment such as a fire on a ship carrying hazardous chemicals.

	# of cars	# of passengers
McNeil Barge and Tug	16	75
McNeil Foot Ferry	0	336
Pt. Defiance Ferry	65	546
Anderson Island Ferry	54	250
Herron Island Ferry	12	49

If a fully loaded ferry were to capsize or sink, the injuries and death tolls could be very high depending on weather and amount of notice before the vessel is submerged. In addition to passenger ferries, there are a number of tour boat operators

who work the waters around Pierce County. Depending on the boat they may have anywhere from ten to a couple hundred people on board.

Commercial shipping traffic in Pierce County follows well defined shipping lanes. By far the majority of all types of commercial traffic flows through the Port of Tacoma. A major fire, hazardous chemical spill, or explosion, either on board or at the Port, could affect not only the City of Tacoma, but depending on wind direction and size of the incident, also Browns Point, Federal Way, Fife or even Puyallup. A much smaller volume of material, usually on small ships or barges, passes through the Tacoma Narrows.

Because of the quantity of materials carried by some of these vessels, a spill, explosion, or onboard fire could affect a significant coastal population.

Marina fires, although connected to the land, can damage or destroy surrounding vessels and if uncontrolled spread shore facilities. There will be no further coverage of marina fires in this plan.

## Occurrences<sup>1</sup>

General occurrences are summarized below. For more notable incidents see Table TA-1 Transportation Accidents/Catastrophic Failures in Pierce County.

- **Road Transportation:** Over the years there have been several major accidents in Pierce County. While many of these have happened along the I-5 corridor others have happened on other major roads, especially on State Route 16 at the Narrows Bridge. The various causes include heavy fog, freezing rain, side winds (especially on the Narrows Bridge) or ice forming on bridges. These types of accidents happen every year. Occasionally tanker trucks, chemical trucks, busses or other vehicles, which could lead to a major incident, are involved. Some of these have closed down the highways for portions of a day and some have required evacuation of neighboring buildings. However, none have caused a large long-term evacuation or closure of a highway.
- **Rail Transportation:** Of rising concern is the transportation of Bakken Crude Oil which brings 123,000 barrels/day or 5,160,839 gallons/day into Pierce County<sup>2</sup>. Although there have not been any major derailments of Bakken Crude Oil in Pierce County, there have

been a considerable number in Canada and the US. Two major derailments of significance include the Lac-Mégantic, Quebec, Canada 63 car derailment on July 5, 2013 which resulted in the death of 47 people due to fire and other effects of the accident.<sup>3</sup> The other derailment was on April 30, 2014 in Lynchburg, Virginia where 17 of 105 tank cars fell into the James River, spilling almost 30,000 gallons of crude oil.

- **Air Transportation:** Pierce County has been the scene of dozens of airplane crashes over the years. Most of these have been small aircraft with one or two people in them. Test pilots from Boeing have crashed in the County. Military planes have flown into each other. Pilots have crashed during 4th of July celebrations. Ultralights have crashed and there is even an incident of a plane attempting to take off without its pilot. Mount Rainier, sticking up above the rest of the County, has accounted for a number of accidents. In addition to these problems, pieces of planes have occasionally fallen off during flights. A jet tire fell on Brown’s Point; a jet canopy popped off and hit a home in 1954; a piece of a C-141 Starlifter fell into a yard in 1979; and in 1984, the tail cone of a Boeing 747 fell into a field north of Puyallup.
- **Maritime Transportation:** The last two major vessel fires in the Port of Tacoma were in 1986 and 1989. There have been a number of small craft that have exploded and burned or sank, as well as fires at marinas. In addition, there are the occasional freighters, like the Ocean Steelhead in 1983 or the Ace Accord in 1986, which have listed and come near to sinking in the Port of Tacoma. Barge shipments containing thousands of gallons of petroleum products are regularly transported up Puget Sound from Tacoma.

**Table TA-1 Transportation Accidents/Catastrophic Failures in Pierce County**

DATE	DESCRIPTION
<b>AIR</b>	
August 10, 2018	A Horizon Air employee stole a 76-person turbo prop plane around 8:00 p.m. from Seattle-Tacoma International Airport and about an hour later crashed it into the south end of Ketron Island (the north end has six cabins). The employee was killed in the crash and no one else was injured.
April 1956	Northwest Orient Airlines flight crashed into Puget Sound on the Pierce/King County border off Dash Point. Of the 37 people on board, all but three survived.
November 27, 1952 Thanksgiving night	A C-54 transport crashed in southern Pierce County killing 37 of the 38 people on board. The lone survivor was a young boy who lost his parents, two brothers and a sister in the crash.
December 10, 1942	Marine transport plane with 32 aboard lost their lives when it crashed into the side of Mt. Rainier.

<b>MARITIME</b>	
August 4, 2019	On Sunday afternoon around 4:30 p.m. Pierce County Planning and Public Works ferry (Christine Anderson) had a catastrophic mechanical failure of the ramp while docked at Anderson Island. This lasted for less than 24 hours but approximately 100 people were impacted as they couldn't get home or go to work the next day. Many people had to leave their vehicles either on the ferry or left them in the ferry lanes on both Anderson Island and Steilacoom.
August 31, 2005	Harborview Marina Fire in Gig Harbor damaged 55 boats and sank 48 of them. <sup>4</sup>
<b>RAIL</b>	
December 18, 2017	At 7:34 a.m. southbound Amtrak passenger train 501, consisting of ten passenger railcars, a power railcar, a baggage railcar, and a locomotive at either end, derailed from a bridge near DuPont, Washington. Several passenger railcars fell onto Interstate 5 and hit multiple highway vehicles. At the time of the accident, 77 passengers, five Amtrak employees, and a Talgo, Inc., technician were on the train. Of these individuals, three passengers were killed, and 57 passengers and crewmembers were injured. Additionally, eight individuals in highway vehicles were injured.
July 2, 2017	At approximately 2:30 p.m. an Amtrak passenger train carrying approximately 250 people derailed near Chamber Creek Rd in Steilacoom. Four rail cars went off the track and there were four injuries. One was from the train derailment and the other three fainted from heat exposure at 92 degrees.
February 26, 2011	A 103-car freight train derailed and side-swiped a 14-car train. The smaller train, carrying four cars of sodium hydroxide, had three cars land on the shoreline near the Chambers Bay Golf Course in University Place. In this incident an estimated 50 gallons of sodium hydroxide discharged into the beach. <sup>5,6</sup>
May 16, 2007	See Figure TA-1 Train Wreck on Mounts/Old Nisqually Road. Minor amounts of diesel were spilled, and three people were trapped and had to be rescued. This incident closed the Mounts/Old Nisqually Road for five days. <sup>7</sup>
February 1996	Freight train carrying chemicals derailed near DuPont during the winter storm and partially went into the Puget Sound. The tank cars were damaged but intact so very little spillage. Not many people were injured as a result.
1984	Amtrak derailment along shore of Puget Sound near DuPont. People only suffered minor injuries.

### Recurrence Rate

Small transportation accidents happen in Pierce County on a daily basis and mostly occur on the roads and highways. The large-scale accidents that threaten the lives and livelihood of a large

number of citizens are much rarer but we've had three in past two years. Reviewing the information above would point to a ten year or less recurrence rate for all types combined.

## Impacts

The impacts of a major transportation accident, although varying depending on the type of accident and the vehicles involved, will have similar factors. Differences between them are discussed as necessary.

## Health and Safety of Persons in the Affected Area at the Time of the Incident

The potential for injury and death are the major impacts from all types of transportation accidents. Traumatic injuries and possible burns are the primary results. For the survivors of a major incident, with a large number of dead and injured, posttraumatic stress disorder (PTSD) and posttraumatic stress (PTS) are psychological impacts that affect first responders, adults and children. With ferry or other marine transport accidents, the potential for drowning and/or hypothermia are additional threats. A ferry that makes runs to Anderson or Fox Islands and is out of service and blocks access to the main dock, delivering baby food and other essential items such as fuel can be a dire need especially in the winter.

## Health and Safety of Personnel Responding to the Incident

The threats to the health and safety of personnel responding to the scene of transportation accidents depend on the environmental factors associated with each incident. Threats include inhalation or contact with hazardous chemicals, fire, explosion; and in water rescues, drowning and hypothermia. As mentioned above posttraumatic stress disorder (PTSD) and posttraumatic stress (PTS) are psychological impacts.

## Continuity of Operations and Delivery of Services

Impact to the continuity of operations and the delivery of services to the public will depend on the type of transportation and the location.

- **Road Transportation:** An incident on the highways while damaging, should not impact the delivery of services or the continuity of operations for any jurisdiction for more than a short period of time (a couple of days). Establishing detours for all major routes is a standard operating procedure that happens frequently.
- **Rail Transportation:** Continuity of operations should not be compromised by a rail accident in most jurisdictions in the County unless there is something to compound the problem. This would most likely be a chemical spill, especially in the form of a toxic cloud. Delivery of services on the other hand could be jeopardized by a train accident that damages or blocks access to critical infrastructure.
- **Air Transportation:** The impact to continuity of operations and the delivery of services from an air transportation incident are directly connected to what is hit by the aircraft. Any object struck by an aircraft of any type will suffer damage. If government buildings

are struck the continuity of operations for that agency or even jurisdiction in some cases with small jurisdictions, could be at risk. If a critical portion of the infrastructure is struck, it could impact the delivery of services that it normally carries out.

- **Maritime Transportation:** A ferry accident that puts a ferry out of commission and/or destroys a ferry dock will heavily impact the delivery of services to the areas served. The ability to get a route back in service will depend on the time it takes to replace or repair the ferry or dock.

A ship sinking in Commencement Bay, especially at the entrance to the Blair Waterway, that could restrict commercial traffic and impact the operations of the Port of Tacoma would have cascading impacts on the supply chain. Currently 80 percent of Alaska's imports come from the Port of Tacoma providing food, medicines and other essential supplies.

Other types of marine accidents, unless combined with an explosion or hazardous chemical spill, will probably not impact service delivery or the continuity of operations.

## Property, Facilities, and Infrastructure

- **Road Transportation:** Most road or highway transportation accidents will result in very little damage to facilities, infrastructure, or property due to the limited or localized nature of any highway accident.
- **Rail Transportation:** Rail transportation events, localized in nature like road events, can cause considerably more damage to property, facilities and infrastructure due to the size of trains and the quantity of materials carried. Any piece of property or facility in close proximity to the tracks has the potential of being damaged or destroyed. This is compounded by any fire or chemical spill that is created by the accident.
- **Air Transportation:** The crash of any aircraft can damage or destroy any property, facility or piece of infrastructure that it hits.
- **Maritime Transportation:** Any property along the Puget Sound shoreline is at risk from a maritime incident. This can come from the actual grounding of a vessel, complications from a fire, or the release of hazardous chemicals.

## Environment

Generally, given the localized nature of the accident, the environment will not be greatly impacted unless the accident involves some other complicating factor. While the normal spill from accidents on the roads and highways of the County can cause minor environmental damage, it seldom covers more than a few dozen square meters and after some clean up the environmental damage is not permanent and will heal over time. Aircraft may contain a large quantity of fuel and in many accidents, this will burn causing local fire damage. Those accidents that might include a large chemical spill and/or fire from a train, aircraft, or a truck accident may take months or years to be resolved.

A perfect worse-case example is the Cantara/Dunsmuir chemical spill of July 14, 1991 in northern California. In this accident all aquatic life in the Upper Sacramento River was killed off when 19,000 gallons of metam sodium, a potent herbicide, and pesticides used to sterilize soil, spilled from a train tank car. In addition, it killed the algae, aquatic plants and vegetation growing along the riverbank.<sup>8</sup> See the chapter on Hazardous Materials for more detail on environmental impacts.

## Economic and Financial Condition

The economic impacts from any transportation accident are directly related to its impact on the ability for businesses and industries to move their goods into, though, or out of the County.

- **Road Transportation:** With few exceptions, damage to roads or bridges from a single incident, while changing the transportation route that cargo travels on the highways, will have little impact on the economic environment. A repeat of the collapse of the Interstate 5 bridge over the Skagit River is the obvious example of a road accident that did impact the local economic environment. Local businesses had to deal with a change in traffic patterns creating excessive truck and other vehicle traffic clogging up of roadways on the alternate routes. We've seen this more recently as unintended consequences to businesses that relied on bringing in customers through foot traffic were especially hit with the constant change in routes for the demolition and removal of the Alaskan Way Viaduct in Seattle.
- **Rail Transportation:** A rail incident involving damage to tracks could force shippers to change the methods of commodity movement. Due to the large quantity of goods carried by a train, if they were destroyed it has the potential to have a strong impact on the financial condition of individual companies. This would be especially true of those companies that operate on a "just-in-time" basis. In the larger economic scheme, while there might be some ripples, it is unlikely to create large changes in the economic climate of the County.
- **Air Transportation:** Major airline companies have insurance that will get them through their financial hardships. Smaller companies or privately-owned aircraft may face real financial hardships but this will not have a widespread impact on the economic climate in the County.
- **Maritime Transportation:** The sheer quantity of goods loaded on ships and barges in Commencement Bay and docked at the Port of Tacoma means that a maritime accident, leading to one being damaged, sunk or destroyed, could impact not only the local economic climate, but the financial wellbeing of companies that may ship material from either overseas or some other part of the United States. If an accident were to block either the Blair or Sitcum Waterways, it would shut down a large portion of the commercial traffic through the Port with major economic repercussions.

## Public Confidence in the Jurisdiction's Governance

Confidence in the jurisdiction will be limited in regard to the majority of service providers are non-profits or the private sector. Questions that arise will include:

- Could the accident have been prevented?
- Who is at fault?
- Was the response well handled?
- How soon will things be back to normal or the issue resolved?
- What measures are going to be taken to prevent a repeat of the incident?

Depending on the answers to these questions the involvement of one or more jurisdictions could be applauded or criticized.

# Resource Directory

## Regional

- **Pierce County Planning and Public Works**  
<https://www.co.pierce.wa.us/4999/Planning-Public-Works>
- **Pierce Transit**  
<http://www.piercetransit.org>
- **Sound Transit**  
[www.soundtransit.org](http://www.soundtransit.org)
- **Northwest Seaport Alliance**  
<https://www.nwseaportalliance.com>
- **Washington State Department of Transportation**  
[www.wsdot.wa.gov](http://www.wsdot.wa.gov)
- **Washington Utilities and Transportation Commission**  
[www.wutc.wa.gov](http://www.wutc.wa.gov)

## National

- **Federal Aviation Administration**  
[www.faa.gov](http://www.faa.gov)
- **Federal Highway Administration**  
<https://www.fhwa.dot.gov/>
- **National Transportation Safety Board**  
[www.nts.gov](http://www.nts.gov)

## Endnotes

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<sup>1</sup> Most information in this section is taken from the September 2002 edition of the Pierce County HIVA. Report done by Glenn Cramer Consulting LLC. (May 30, 2014). *Pierce County HAZMAT Truck Flow Study*.

<sup>2</sup> Bakken Crude Oil distributed by the NW Area Committee. February 2015. Data for calculation of statistics can be found on page 3.

<sup>3</sup> Ibid, page 7.

<sup>4</sup> Harborview Marina Fire at Gig Harbor, Washington Department of Ecology, report at <http://www.ecy.wa.gov/programs/spills/accidents/harborviewmarina/HarborViewMarinaFirebase.htm>

<sup>5</sup> Department of Ecology. (Dec. 1, 2011). *BNSF Train Derailment*. Retrieved February 23, 2015 from <http://www.ecy.wa.gov/programs/spills/accidents/ChambersBayDerailment/ChambersBayDerailment.html>

<sup>6</sup> Attachment distributed by the NW Area Committee in an email from Lori Gifford with the Washington Military Department [lorri.giffore@mil.wa.gov](mailto:lorri.giffore@mil.wa.gov) dated 2/24/2015. Currently (dated Feb. 2015) around 19 trains/week in Washington State transport Bakken Crude Oil, of which 15 enter Pierce County. Bakken Oil is unloaded at (48,000 barrels/day) at U.S. Oil and (75,000 barrels/day) at Targa Sound in Tacoma.

<sup>7</sup> Information on this accident came from the incident logs, situation reports and other archived ICS documents from the incident.

<sup>8</sup> Final Report on the Recovery of the Upper Sacramento River – Subsequent to the 1991 Cantara Spill, The Cantara Trustee Council, 2007, p. 3.