RIVERINE FLOODING DISRUPTION

A massive storm system dumped **20 inches of rain on the city within 24 hours**. This caused major flash flooding across the city, creating a crisis for people and assets in riverine flood zones. This is the most precipitation the city has experienced in a 24-hour period. Scientists are saying these types of rain events will be increasingly common. It took nearly a week for the waters to recede.

People in flood zones were stranded on top of their houses and their cars, and with floodwaters overtaking the major roadways, emergency rescue took days. In addition, many assets sustained flood-related damages, including mold infestations.

Flooding: Transportation Hub

Did you protect Transportation Hub?	Did you not protect Transportation Hub?
The State Department of Transportation gives your city $50,000 for proactively protecting the transportation hub and maintaining transportation throughout the city.	Massive delays impact the economy and lead to a $1 million loss in revenue form the local economy. This removes $80,000 from your budget due to impact on taxes.

Flooding: Hospital

Did you protect the Hospital?	Did you not protect the Hospital?
FEMA gives you an award of $350,000 for ensuring your hospital maintained high level functioning during the extreme flooding.	The Hospital basement flooded, rendering the generators useless. When the power failed, several patients died from the flood due to the inability to evacuate. You lose a lawsuit from the families of the people who died and lose $500,000 from your budget.

Flooding: Main Roadway

Did you protect the Main Roadway?	Did you not protect the Main Roadway?
The State Department of Transportation gives your city $50,000 for proactively protecting the roadways and maintaining connectivity throughout the region.	The Evacuation Route was flooded, making it impassable for residents fleeing the floodwaters. Multiple families had to stay behind, leading to an increased need of emergency services. The City Council removes $10,000 from your budget to pay for the overtime of emergency personnel.

Flooding: Transportation Hub (cont.)

Impact Category	Example Impacts of Flooding on Transportation Hub and Cascading Impacts on City
Infrastructure	• Inundation would cause damage or destruction to hub infrastructure and to any buses or rail cars not moved to higher ground ahead of floods, delaying transportation times.
Social Systems & Public Health	• Inundation of the hub could prevent city residents without alternatives to evacuate (leading to injury), reach work (leading to loss of income), or reach school (leading to missed schooling).
Economic	• Repair and rebuilding costs, including labor, impacts to city budget.
Environmental	• Increased use of personal vehicles in the event transportation hub is non-functional, resulting in increased greenhouse gas emissions and localized air pollution.

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Flooding: Main Roadway (cont.)

Impact Category	Example Impacts of Flooding on Main Roadway and Cascading Impacts on City
Infrastructure	• Inundation would cause damage or destruction to roadway, including pot holes and potentially washing away sections of the road.
Social Systems & Public Health	• Inundation of roadways could prevent evacuation of city residents, increasing potential for injuries and fatalities.
Economic	• Roadway repair and rebuilding costs, including labor, impacts to city budget.
Environmental	• Increased stormwater runoff of roadways, causing increased pollutants to enter the local waterways.

Flooding: Hospital (cont.)

Impact Category	Example Impacts of Flooding on Hospital and Cascading Impacts on City
Infrastructure	• Inundation could cause damage, including mold, or destruction to Hospital building.
Social Systems & Public Health	• Hospital may not be functional for some amount of time, leading to further sickening or death of residents in need.
Economic	• Cost to repair damages and to pay workers overtime in event additional medical needs arise among residents.
Environmental	• Medical waste could pollute land and waterways if they escape the hospital during flooding.

Flooding: Dam

Did you protect the Dam?	Did you not protect the Dam?
The dam is able to withstand the floodwaters brought on by this storm. The City Council awards your efforts to protect the dam by allocating an additional $20,000 to your budget.	Massive damages occur when the dam is force to release water due to the excessive volume of water coming from upstream. Ten commercial buildings along the Riverwalk are damaged due to this release. You lose a lawsuit from the Riverwalk Economic Association and pay out $200,000 from your budget.

Flooding: Power Plant

Did you protect the Power Plant?	Did you not protect the Power Plant?
You managed to avoid any brown- or black-outs regardless of the flooding. You receive an additional $20,000 in your budget from the increased economic activity.	Power Plant has rolling brownouts due to flooding and there is an estimated $1 million impact to the city's economy. You lose $30,000 from your budget to help support revitalizing the economy post-brownouts.

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Flooding: Power Plant (cont.)

Impact Category	Example Impacts of Flooding on Power Plant and Cascading Impacts on City
Infrastructure	• Increased potential for damage or destruction to power plant infrastructure.
Social Systems & Public Health	• Impacts of power outages to the city population and those reliant on electricity for life-saving purposes, e.g., hospital patients.
Economic	• Potential cost, including labor, to repair damages to the plant.
Environmental	• Increased use of generators across the city in the event of a power outage, resulting in increased greenhouse gas emissions and localized air pollution.

Flooding: Dam (cont.)

Impact Category	Example Impacts of Flooding on Dam and Cascading Impacts on City
Infrastructure	• Increased potential for damage or destruction to dam infrastructure. • Increased flooding risk for infrastructure upstream of the dam since the dam restricts water flow, and to infrastructure downstream in the case of a dam breach.
Social Systems & Public Health	• Dam breach would greatly increase potential for injuries, fatalities and property damage.
Economic	• Dam reinforcement/monitoring or repair/rebuild, including labor, impacts to city budget.
Environmental	• Habitat loss in the event of dam failure and sudden floodwaters downstream.

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