

98-186

Roller Coasters: Background and Design

Spring 2015

Week 15 Notes

Disney World

Why Talk About Disney World?

- Even though the class is called 'Roller Coasters: Background and Design', we still spend time talking about other facets of the amusement industry, like amusement parks, that are integral to roller coasters
 - See all of the stuff about amusement parks from Weeks 12 and 13
- Disney World isn't very exciting from a roller coaster perspective: only 9 coasters in total (Cedar Point alone has 16)
- However, it is easily the most visited amusement complex in the world
 - Magic Kingdom is the most visited amusement park in the world, at 17 million visitors annually (for reference, the most visited seasonal amusement park in North America, Canada's Wonderland, had 3.5 million visitors in 2011*)
 - The other three parks are 6th, 7th, and 8th place, only beaten by other Disney properties world-wide
- Also, like Disneyland, Disney World has had a very large influence on the design of other amusement parks

*Note: Remember that seasonal amusement parks usually operate only half a year, whereas Disney World parks are open all year round. This accounts for some of the discrepancy in visitors per year, but obviously not all of it.

General

- Officially the Walt Disney World Resort, Disney World is located in Lake Buena Vista, Florida, which is just south west of Orlando
- Disney World covers an area of 47 square miles, about the size of Nantucket (or twice the size of Manhattan)
- It consists of 4 major theme parks: the Magic Kingdom, Epcot, Disney Hollywood Studios, and Animal Kingdom (all are discussed below)
- In addition, there are 2 water parks, 24 themed resorts and hotels, 5 golf courses, 2 spas, and many more attractions

Walt Disney

- Disney World represents the life and legacy of Walt Disney, the man who started it all
- Walter Elias Disney was born in 1901 near Chicago, but grew up in Kansas City. It was there that he began his career as an animator with his own studio
- He moved to Hollywood in the 1920s and earned success with Oswald the Lucky Rabbit and Mickey Mouse. He almost went bankrupt when making Snow White and the Seven Dwarfs, but its popularity secured his place in the animation and film world.
- In 1955, Disney followed his dream of making a place for parents to have a good time with their kids with the creation of Disneyland in Anaheim, California (more on that in Week 4), which

became the most popular amusement park of the time and the most significant influence on many amusement parks made in the 1960s and 1970s

Origins of Disney World

- Walt Disney was pleased with the results of Disneyland in general, but thought he could do much better. He had two main complaints with Disneyland
 - Around Disneyland had been built many non-Disney hotels and attractions in a haphazard fashion, which caused the environment of Disneyland to seem more commercial and less 'Disney magic'
 - A common story told is of how Disney was walking through Disneyland one day and saw a cowboy from Frontierland strolling through Tomorrowland. The western character in the futuristic area immediately ruined the magic in his opinion
- From a business perspective, Disneyland was missing a major demographic of Americans; only 5% of their visitors came from the east of the Mississippi, whereas 75% of Americans at the time lived east of the Mississippi
- These factors came together to form a plan for what would become Disney World, which wouldn't just be a 'East Coast Disneyland', but rather a full-fledged resort controlled by Disney
- Disney investigated many areas, but finally settled on Orlando, Florida for several reasons
 - It was in an area with good weather year round
 - It was near the planned I-4 highway, allowing for good road access
 - It was near Orlando's airport
 - Most of the land was undeveloped swamp land, making it very cheap (\$180 an acre)
- Began purchasing land in 1964. To keep land cheap, Disney used dummy corporations like Tomahawk Properties and Latin-America Developments to buy the land without the Disney name. This worked until late 1965 when Orlando News broke the story. Following this, Walt Disney organized a press conference to announce his plan and vision of Disney World to the world
- Before construction could begin, tragedy struck with Walt Disney's death in 1966 due to lung cancer. His death derailed the whole project, because he was the main driving force behind it. It took a year until Walt's brother decided to put off retirement to oversee the project.
- While Walt's original plan called for many grand features in addition to theme parks, like an airport and a city, these were abandoned after his death (more on the city in the Epcot section)

Magic Kingdom

- Construction began on the Magic Kingdom in 1969, with most early efforts involving draining the swamp and removing dense swamp foliage to make adequate ground for construction
- In order to provide a way to carry out park operations like trash collection and employee movement out of sight of park guest, engineers decided to put utility corridors under the Magic Kingdom to accomplish this goal. However, the water level in Florida is too low to allow for digging corridors into the ground.
 - The solution? Build the corridors on ground level, and then build the Magic Kingdom *on top* of them. This means the Magic Kingdom guest see is actually just the 2nd floor of the Magic Kingdom, a full 14ft above where the ground used to be
 - The utility corridors, or utilidors are actually quite incredible: they house a pneumatic trash collection system, office building space for operations, employee makeup rooms and cafeterias, and much more

- Another issue with construction was the park's centerpiece, Cinderella's Castle. While designers wanted the largest structure they could make, they couldn't build taller than 200ft tall without needing a flashing light on top. So they shrunk the size of windows and other features that were up high and used the trick of perspective to make the 189ft tall castle look much taller
- The Magic Kingdom, along with the Contemporary and Polynesian Resorts, open on October 1st, 1971 (to a flawless opening day compared to Disneyland's opening day 16 years earlier)
 - It was an instant hit; within 2 years it had 10 million visitors annually
- The park itself is quite similar to Disneyland, with different lands position around the central hub of Cinderella's Castle. Some of the areas have counterparts in Disneyland, like Tomorrowland
- In 1975, the park got its first roller coaster, Space Mountain (it was also Florida's first coaster ever). It was originally planned for Disneyland in the mid-1960s, but put on the back burner. It is an enclosed steel coaster that is actually two coasters which are mirror images of each other. The track design is similar to a wild mouse, with sharp turns and sudden drops. Passengers sit in inline fashion, like a sled.

Animatronics (or Audio-Animatronics)

- One of the things that sets the Magic Kingdom apart and really brings it to life is the use of animatronics. Animatronics, which comes from animated mechatronics, are robots that act out their roles to entertain, like actors in a movie.
- Disney was a pioneer in animatronics, using the idea in Disneyland for the Enchanted Tiki Room in the early 1960s
- For the 1964 World's Fair, Disney produced a life-sized animatronic of Abraham Lincoln who could stand up and deliver a speech. It was hugely popular and was moved to Disneyland after the Fair
- There are over 1,100 animatronics in the Magic Kingdom, on rides like the Jungle Cruise and the Hall of Presidents

Epcot

- Epcot in Walt Disney's original plan was the Experimental Prototype Community of Tomorrow, a planned city meant to show off new technologies and community living
 - The city consisted of the same radial design as most Disney parks, with a commercial city center in the middle, recreational green areas surrounding that, and suburb style housing outside of that.
 - Transportation around the city would be primarily focus on People Movers and Monorails rather than automobiles.
 - The city ideas were quite grand, calling for something like the utilidors in the Magic Kingdom but on a city scale as well as a fully enclosed city center with climate control.
 - The plan also called for some 'out-there' ideas, like no retirement and limited private property.
- After Disney's death, the plans for the city was abandoned, but in 1979, they decided to pay homage to this idea with another theme park for Disney World
- Construction started in 1979, and the park opened in 1982
- The park's centerpiece is Spaceship Earth, an 18 story tall geodesic sphere (the world's first). The sphere houses a dark ride, also called Spaceship Earth.
- The park is split into two sections
 - One section consists of futuristic rides and attractions, like Mission: Space and Test Track. This is the part most connected to the original EPCOT idea

- The other section is a 'permanent world's fair', with pavilions for different countries. Countries featured include America, Germany, Mexico, Norway, China, Italy, Japan, Morocco, the UK, Canada, and France

Monorail

- A 14 mile monorail track runs between the Magic Kingdom and Epcot
- The monorail was part of Disney's vision of futuristic cities, and he believed such technologies were superior to other forms of transportation (ie cars, busses).
- The trains run off electric motors powered by a 3rd rail, like most subways. This system runs silently, allowing the monorail to pass through the middle of the Contemporary Hotel without making any noise
- The monorail system at Disney World is the most heavily travelled monorail system in the world

Disney Hollywood Studios

- The original idea for Disney Hollywood Studios came from a proposed addition to Epcot themed after movie making. The CEO at the time decided that such an idea would be better suited as its own park.
- The park opened in 1989 as Disney MGM Studios with a deal from Metro-Goldwyn-Mayer for the MGM name. This was changed in 2007 after legal snafus
- The park has themed sections like other theme parks, but has less of a radial design than the others. The center-piece of the park is a Sorcerer's Hat based off the one worn by Mickey in Fantasia
- The park has many rides and attractions themed after films, like Star Tours (Star Wars), a Raiders of the Lost Ark stunt show, and a playground themed after Honey, I Shrank the Kids
- One of the parks signature attractions is the Twilight Zone: Tower of Terror. Themed around the Twilight Zone TV series, the ride simulated an out of control elevator ride in a spooky hotel
 - Riders sit in rows in an elevator car, held in only by a seat belt
 - The ride begins with a series of rises, with the doors opening at certain levels for show elements
 - Then the car exits the elevator shaft and moves along the ground (with more show elements) to another shaft
 - Here, the elevator car begins a series of rapid falls (the cars are actually pulled down rather than just gravity) and rises before the ride ends
 - Some of the ride sequence is randomized, making the ride experience different every time
- Another signature ride is the Rock'n'Roller Coaster, an enclosed roller coaster built by Vekoma in 1998. The coaster begins with a launch to ~60mph before entering a series of 3 inversions and other twists and turns. The ride is themed after Aerosmith and features Aerosmith music being played by speakers right next to the riders' heads in the cars. The interior of the building has rock concert effects, like laser lights

Animal Kingdom

- Animal Kingdom, which opened in 1998, is the newest of the parks and also the largest at 500 acres (roughly the size of all the other parks combined)
- The center-piece of the Animal Kingdom is the Tree of Life, a 145ft tall artificial tree with a 50ft across trunk. The tree also houses a theater underneath it (which presented an engineering challenge, due to the high forces caused by wind blowing through the branches).
 - The trunk of the Tree of Life is not sculpted to look like bark, but is rather covered with hundreds of sculpted animals
- The largest attraction is Kilimanjaro Safari, a large safari style ride where riders ride a vehicle driven around an African themed area where they can view animals in native seeming environments
 - To get animals to 'play along' and stay within sight of the vehicle, engineers placed hidden obstacles like moats and fences covered by grass to keep animals in their places. They also used tricks like mists, shade, and food.
- In 2006, the park opened Expedition Everest, a large roller coaster which travels around and through an even larger mountain (199ft tall). The coaster was built by Vekoma and features track switching sections to allow for both forward and backward travelling sections of track.
 - The roller coaster structure is completely independent of the mountain structure, and the two never come into contact anywhere. Since they interlock, this required simultaneous building of both

Note: Most of this lecture is based off of material from *Modern Marvels: Disney World*. You can view the show on YouTube