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# 1 Game Mechanics

\*= user comments/amendments

\*\* = mod/coder comments amendments

## 1.1 Overview

A game requires a distinction between failure and success. The player must know their status while they play. The player's actions must influence the outcome. These actions include responding to random events. A set of rules govern the events (including player actions) within the game. The rules of the game must be self consistent, believable and apparent.

This game allows the player to build and experience a theme park. A successful park will be profitable and popular. The popularity of a park is determined by the overall experience of guests. Guests experience the park by going on rides, attending shows, observing scenery/theming, and shopping/consuming. Guests can be individuals or parts of groups. Guests have their own preferences. Rides, shows, etc have their individual influences. Consistency and quantity of theming will have influences. The player constructs a park by placing individual elements in a pattern of their choosing. Some rides such as coasters are themselves constructed from individual track components. Buildings can be constructed from components or all at once as a simplified complete structure. Walkways and public facilities are essential construction items as well. The player can modify the landscape including water and underground features. Different climates are available, including imaginary settings (ie. low gravity planets). Music supplements the player's experience while also having an influence on the guests. The player can access information about the popularity and profitability of the park to guide their design choices.

The player has the choice of playing individual or sequential scenarios, or simply starting with a blank landscape. Scenarios have specific goals and may include limitations on construction. The financial model can be disabled/enabled if desired. Editors are provided which allow for creating scenarios, landscapes, shows, new rides, new scenery items, new walkways, new textures for use in the various items, and new guests. Custom created items can be imported and exported. With a suitable host and network connection, multiple players can construct and experience a common park. The player can assume the perspective (camera view) of a guest and experience the park like an individual in their park, including riding the coasters and other rides.

The player has executive control over park employees and ride operating conditions. These items normally function independently within the control parameters. Larger, more

complex parks do not necessarily require more player attention than smaller parks. Rides can experience random events such as malfunctions. Guest behavior is based on their preferences versus available options and is influenced by random variations.

## **1.2 Player Activities**

This game provides the player with several activities. In addition to the player's actions, the characters within the game are independent and carry out their own actions described later. Certain activities take place within the game world (such as weather) independent of the player's actions. The player's gaming experience is mostly a result of the activities described in this section.

### **1.2.1 Settings**

A handful of items can be set and will remain in effect unless they are changed again. Some of the items are specific to the player and should be default conditions upon the next time the game is started. Localization, Audio and messaging settings should be default conditions. Others items are specific to the particular park and should be contained within the park file. These include guest, employee and weather settings.

#### **1.2.1.1 Localization**

Initially, the game should check the user's computer environment for information about their localization. If none is found, the game will start in English. Upon subsequent runs of the program, it will use the previous settings.

##### **1.2.1.1.1 Language**

Text information within the game will be available in several languages. Only one language will be active at a time. Voice messages within the game will be in the same language. The player can select from English, German, Italian, French, Spanish, Portuguese or Dutch. Other languages will be included in the initial release if possible. New languages will be made available in the future as downloadable extensions. The player can designate custom audio files for the voice messages.

##### **1.2.1.1.2 Units**

The player can choose either metric units or standard units. Colloquial hybrid metric units will be used when appropriate. For example, Kilometer per Hour will be used rather than Meter per Second. The choice of units only affects displayed values. The game will use metric units internally.

### **1.2.1.1.3 Currency**

The player can choose currency units from Dollars, Pounds, Marks, Lire, Francs, Peso, Escudos, Guilders or Euros. A downloadable language extension will include a new currency unit if needed. When changing currency, an exchange rate will be imposed based on an updatable table. A single inflation value can be used to update prices over time.

## **1.2.1.2 Interface**

### **1.2.1.2.1 Audio**

The player can adjust the levels of sound effects and music. Music is associated with rides in the park. The volume will depend on how close the player is to given rides. The volume of sound effects will also depend on how close the player is to the event.

### **1.2.1.2.2 Manual Input**

The keyboard key mapping and mouse button usage can be modified.

### **1.2.1.2.3 Visual**

The screen resolution can be set.

## **1.2.1.3 Guests**

Guests in the game behave independently. The player can set some general attributes. These attributes will affect new guests as they are generated. To change all the guests, the player will have to close the park and wait for all of the old guests to leave, then open the park so that new guests with the new settings will populate the park. This discourages changes in the guest settings for existing parks. These settings will normally be unchanged during routine play.

### **1.2.1.3.1 Groups**

The player can choose whether guests should all be independent, all be members of groups, or some combination of these two extremes. If a combination is selected, the ratio of the two types can be specified. Guests are of three ages: child, teen and adult. The player can specify the ratios of the age groups. The player can choose to eliminate one or two of the age groups. By default, grouped guests will be generated as two adults, one teen and one child. By default, ungrouped guests will be generated as equal numbers of adults, teens and children.

### **1.2.1.3.2 Preferences**

Guests will have ride preferences. (spinning, height, speed, interactivity, entertainment) Teens typically prefer the more intense rides. Children prefer less intense rides. Adults have a range of preferences. The player can adjust the typical preference for each age group. The guests will be generated with a range of preferences centered about the set value.

The player can choose to automatically pause the game while building tracked rides. This feature can also be toggled within the construction menu.

### **1.2.1.3.3 Money**

Guests will be generated with an average amount of money to spend. They will be able to get more money while in the park. The player can specify how much money they start with (on average). There is also a setting for how readily guests will spend money. Miserly guests will make it difficult to make the park financially successful. Frivolous guests simplify the park's finances. This is the chief method of implementing a difficulty setting for the game. The player can also choose to disable finances in which case the game will be inherently easy.

## **1.2.1.4 Weather**

A scenario will take place in a specified environment. The player can change the environment settings, however. The average temperature and seasonal variation of temperature can be specified. The day to night variation of temperature can also be specified. In addition to temperature, precipitation patterns can be specified. Precipitation will be rain or snow depending on temperature. The player can specify a range of precipitation levels. In addition to full control of these settings, the player also has the option of selected a predefined weather pattern from a list. The choices are a matrix with tropical, southern temperate, northern temperate and polar on one axis and desert, coastal, mountain and plains on the other. These settings do not change the terrain; they are just used to specify typical weather patterns associated with such environments.

## **1.2.1.5 Messages**

The player can specify if they want to receive messages generated by the game. Such messages inform of major problems. The player can specify if they want an audio alert, a token visual alert or a pop up window for messages.

During a multiplayer game, the player can choose to chat with other players via message boxes. These can be activated or blocked individually or globally.

## 1.2.2 Construction

Since this is a building game, the most important player activity is construction! The player can modify the terrain, build paths for the guests, erect many rides and also place scenery items throughout the park. To accommodate players of varying skill and experience level, a simple construction method is provided for all items. Some items also feature more advanced construction techniques to allow greater control.

### 1.2.2.1 Terrain

#### 1.2.2.1.1 Surface

\*The land in the park can be modified in height and appearance. The surface texture can be selected from a list of grass, gravel, rock, mud or sand. Custom textures can be used also. Exposed [vertical faces](#) of land can be the same as the surface (the default) or can be specified separately. In addition to the same choices listed above, the [faces](#) can also be brick, stone, tile or boards.

For the purpose of terrain editing, the surface will be presented as a perpendicular grid. The dimensions of each square are 3 meters on a side. Each square can be individually edited with regard to height and slope. The player can choose to use the default step size for the height or can choose to use freeform heights. A square's slope can be selected from a set of defaults (5, 10, 15, 30, 45, 60 or 75 degrees) or can be set to a freeform value. Groups of squares can be selected for combined editing. The player can choose to use regions with 1 to 16 squares per side. By default, the region will be square but the player can select a rectangular region if desired. [A similar but slightly more limited system is used for editing exposed vertical faces.](#) The 3 meter x 1 meter faces can be extruded in 3 meter square steps to create overhanging terrain. Similarly to the terrain surface, a face's angle to the perpendicular grid can be selected from the set of defaults or can be set to a freeform value. An option will be made available to mark on the visible surface any subterranean surfaces, making it easier to locate caverns made by extruding faces over surfaces below. As the terrain casts a shadow upon itself, caverns will appear naturally dark and will need to be lit manually by adding light sources.

The land in the park can be modified in height and appearance. The surface texture can be selected from a list of grass, gravel, rock, mud or sand. Custom textures can be used also. Exposed edges (vertical faces) of land can be the same as the surface (the default) or can be specified separately. In addition to the same choices listed above, the edges (faces) can also be brick, stone, tile or boards.

For the purpose of terrain editing, the surface will be presented as a perpendicular grid. The dimensions of each square are 3 meters on a side. Each square can be individually edited with regard to height and slope. The player can choose to use the default step size for the height or can choose to use freeform heights. A square's slope can be selected from a set of defaults (5, 10, 15, 30, 45, 60 or 75 degrees) or can be set to a freeform value. Groups of squares can be selected for combined editing. The player can choose to

use regions with 1 to 16 squares per side. By default, the region will be square but the player can select a rectangular region if desired.

### **1.2.2.1.2 Underground**

In addition to editing the surface, player can also create underground chambers. The floor and ceiling of chambers have the same texture selections as the surface. Underground chambers will have a default ambient lighting. The player can deactivate this. In addition to completely underground chambers, the player can also create undercut cliffs.

An underground chamber is created by first activating a command. A default square or round chamber is created and the player is allowed to change its dimensions as well as position it. A shadow appears on the surface to help locate the chamber. A chamber's size and location can be changed after it has been placed. Tunnels and elevators typically connect chambers to the rest of the game world. A chamber can be removed by selecting it and activating a command. All non-tunnel items in the chamber will be automatically deleted.

### **1.2.2.1.3 Water**

The player can activate a water table feature will place water over all terrain up to a certain elevation. In addition to this global water table, local water tables can be set separately by one of two methods. First, the player can designate a point on the surface and then activate a command to apply a water table at a certain height at that point. Water will be extended to surrounding terrain until the height limit has been met. This facilitates making lakes at different heights. The player can also raise or lower an existing water table by the same actions. The second method is to specify an area on the surface to apply the water table to. This may result in an "edge" of water. Although this is not a natural phenomenon, it is a complication of the game and will be dealt with by using a special texture for water edges. If changing a water table will interfere with existing rides, the player will be warned. Interference could occur if the water table is raised and would flood a ride; it would also occur if the lowering the water table would strand a water ride. Water tables can be applied within chambers. They are independent of water tables in nearby surfaces. Water textures can be chosen from: blue, green or murky. Note that waterfalls are available as scenery items.

### **1.2.2.1.4 Saving**

The player can save a terrain as a file. This is a separate function from saving a park. A terrain file contains just the terrain.

The player can also save a chamber as a separate file. Saved chambers will include scenery and any ride items which are completely located within the chamber. Chambers can be created as new items or loaded from files.

The player can also save a region. A region is a subset of the park. All objects within the specified region will be saved as a file. A region can be loaded into a park if desired.

## **1.2.2.2 Paths**

### **1.2.2.2.1 Walkways**

There are two techniques of constructing paths (walkways): “tile” and “freestyle”. For either technique, the player can select the surface texture (asphalt, tile, brick, dirt, concrete, wood plank or custom) to be used while building and can later edit the texture without having to rebuild. One surface quality modification is a “moving walkway”. For these, the direction and speed can be set. If two moving walkways touch each other at ends with different directions, the player will be warned. A moving walkway with a steep (45°) slope automatically becomes an escalator. Moving walkways use a special surface texture (tread or custom).

For either construction technique, the player can choose to have automatic removal of any objects in the way of the path as it is built. The player can also choose to be warned first before objects are removed. The player can choose to have terrain automatically modified (raised or lowered) to accommodate the path as it is being built. If the player prefers, the path can auto generate supports when built above the terrain surface. Another option is to form tunnels. A tunnel entrance can be at any angle to the ground. Tunnel entrance textures can be specified as brick, cement, tile, wood, steel, dirt, marble or custom.

The first path construction technique is a traditional “tile” approach. With this approach, tile placement is based on a virtual grid on the surface. the player can place tiles by clicking on the ground for each piece or by clicking and dragging across the surface to place multiple tiles. As an alternative to clicking on the surface, the player can choose to use a menu based tile placement scheme. In this situation, the player first indicates a starting point and thereafter clicks on the menu items to have the path tiles placed in the orientation desired. The menu provides the options for both straight and curved path tiles at various angles. The radius of curved pieces can be selected from fixed values or can be finely adjusted. In addition to staying flat on the surface, the paths can slope up or down by fixed angles or the angle can be adjusted. When building with the menu, there is also an undo feature to allow erasing the most recently placed pieces.

*The second path construction technique is called “freestyle”. This scheme is not constricted to any sort of grid (though optional snap-to-grid will be available). Freestyle (FS) paths can be built by interacting with the surface or by making use of a menu. To place an FS path segment directly, the player clicks on the surface to specify the start and end point. A path will be automatically generated between those two points. If there are preexisting paths at the ends, the new path will be automatically aligned with them. The user can modify this (ie break the alignment) by use of the menu if desired. The new path segment will be highlighted to indicate that it can be further modified. An existing path segment can be selected for modification at a later time. Two modifications that can be*

*done without the menu are “set curvature” and “adjust elevation”. By clicking and dragging on a highlighted segment, the segment will be curved while it is dragged. The endpoints will remain where they were. The player can “nail” part(s) of the segment and then proceed to curve other parts of it. The whole segment will be curved with inflections as needed to keep the ends and nailed points in their place. This allows for creating “S” and more complicated curves. The FS system also allows some more complicated paths to be constructed by use of a menu system. The player can select a shape such as: arc, circle, ellipse, square, rectangle, or hexagon. The center can be specified and then the shape drawn. This allows for easily making concentric arcs or complete circles. By specifying circles with elevation, a spiral path or staircase can be made. Lastly, the player can modify the width of path pieces at any time.*

Another path transportation device is the elevator. Elevators can be placed most anywhere and can traverse earth and structures. Elevators will stop at “floors” as determined by the presence of paths. If an elevator is within a building, it will stop at the floors of the building (see Building Generator).

#### **1.2.2.2.2 Queues**

\* Queues can be built like walkways or they can be built as a special structure. When building queues like walkways, the player can either construct the queue path or select existing paths to be converted to the queue. Queue paths have additional graphics (handrails) to distinguish them from regular paths. For a special queue structure, the player specifies a rectangular area. That area will become a tighter serpentine queue line. This more closely resembles real queue lines. [If a queue line is filled or one is not specified, a line will form naturally following any ordinary pathways linked to the ride entrance or queue line.](#)

Ride entrances will typically be attached to a queue – but a queue is not absolutely required. Queues can be built like walkways or they can be built as a special structure. When building queues like walkways, the player can either construct the queue path or select existing paths to be converted to the queue. Queue paths have additional graphics (handrails) to distinguish them from regular paths. For a special queue structure, the player specifies a rectangular area. That area will become a tighter serpentine queue line. This more closely resembles real queue lines. Queue lines cannot contain enhancements other than video monitors. [If a queue line is filled or one is not specified, a line will form naturally following any ordinary pathways linked to the ride entrance or queue line.](#) Guests are less likely to join a line than to enter a queue.

#### **\*\* .2.2.2.4 Ride Queue Piping**

[This allow a user to link up multiple rides. They do this through the Pipe Button that is attached to an entry and exit queue. Users specify a ride exit queue and than pipe that exit que to the entry queue of another ride close by.](#)

[Example would be for instance elevator exit queue to entry queue for haunted mansion tracked ride. This would cause peeps exiting the elevator to goto the entry queue and get on the haunted mansion ride.](#)

The queued rides act as one large ride. Price for tickets to the first ride in the queue also allow free usage of the additional queued rides that are linked through the piping.

Users would be more encouraged to go on Piped rides than standalone rides.

Breakdowns on Piped rides that follow do not occur, only the first ride that is in the piping can have a breakdown.

### **1.2.2.2.3 Enhancements**

Several items can be added to a walkway. Most of them are placed on the edge of the walkway.

Lamps: The player can select from a variety of lamps (single post, triple bulb, tall post with ring of bulbs or custom).

Benches: A variety of benches are available. Bench textures are wood, cement, steel or custom.

Tables: Guests will sit at tables to eat or rest. Tables can hold up to six guests. Tables are not added to the edge of a walkway – they are placed in the center of a “tile”. The player will typically place path pieces to the side of the main path and put tables in those areas. Tables can be round or rectangular. The texture can be cement, wood, marble, steel or custom.

Trash Cans: Trash cans should be liberally placed in the park. Trash cans are round steel cans but they can be contained inside covers of cement, brick, marble, wood or custom. The player can select from these options and can change an already existing trash can.

Drinking Fountains: A variety of drinking fountains are available (steel pedestal, cement pedestal, marble pedestal, steel chiller or custom). The player can select from these options and can change an existing fountain.

Map: A large map can be placed beside a walkway to help guests find their way around the park.

Signs: No-entry signs can be placed across a walkway. The direction of the sign can be changed after it has been placed. The function of the sign can be toggled on and off after it has been placed. Advertising signs can be placed beside or across a path. Rides can be promoted by these signs. The player can also load a custom graphic onto a sign but it will not affect the guests. Advertising signs can be small, medium or large and can be lighted as well as animated. The graphic image on the sign can be changed after it has been built.

Queue line monitors: These can only be placed in queue lines

Public Address: Speakers that promote events and rides.

## **1.2.2.3 Rides and Shops**

### **1.2.2.3.1 Flat**

The player selects a flat ride from a menu. The ride can be themed by selecting from a list before or after placement. A ride appears in the menu only once, no matter how many themed versions are available. Some rides are scalable and the desired size is chosen before placement. The ride is placed on the map at the desired location. The ride can be rotated after being placed if desired. The player selects locations for the entry and exit points. Rides have some controls such as speed and duration which are accessible via a menu. The exit must be connected to a walkway; an automatic create feature will make a path to the nearest walkway. The entry must be connected to a queue line type path or a queue line area. The ride can be opened or closed. By default, a flat ride is open upon construction. Some flat rides have ratings which are mostly fixed while others have ratings depending on the control settings. In either case, the presence of scenery and other rides can influence the ratings. The player is informed of the cost of construction before they build a ride.

Flat ride categories are: Vertical Spinning, Horizontal Spinning, Tower, Maze and Other.

#### **1.2.2.3.1.1 Vertical Spinning**

These rides are placed by their platform outline. Available rides are:

Ferris Wheel: The player can choose the size on the basis of number of seats.

Swinging Ship:

Looping Ship: the player can set the number of loops.

Top Spin: the player can set the intensity and ride time.

Zipper: the player can set the size (number of seats), speed and ride time.

#### **1.2.2.3.1.2 Horizontal Spinning**

Carousel: The player can choose one or two levels and can choose the size on the basis of number of seats. The player selects the ride time.

Revolution: The spinning seat section swings on a pendulum. The player selects the rotation speed.

Scrambler: The player selects the rotational speed and ride time.

Tea Cups: The player selects the rotational speed and ride time.

Tilt 'o' Whirl: The player selects the rotational speed and ride time.

Enterprise: The player selects the rotational speed and ride time.

#### **1.2.2.3.1.3 Tower**

Tower rides are constructed by placing a platform at the base and then specifying the height of the tower. The tower height can be modified after the ride is built. Standard tower rides to be available are: Observation, Launch and Rotary.

Observation tower: can be one or two levels.

Launch tower: the player can select the launch speed.

Rotary tower: The player can set the rotational speed and time at top.

#### **1.2.2.3.1.4 Maze**

Maze rides are constructed by specifying an area for the maze and then placing wall segments on a grid over that area. The player can place and remove walls until they are satisfied with the layout. There is one entrance and exit area. These must be connected. If there is no path between them the player will be warned and the ride cannot be opened. The wall type can be "Hedge" or "Mirror". The wall type can be changed after the ride is constructed.

#### **1.2.2.3.1.5 Other**

Rides in the "other" category are placed by their platform outline.

Bumper Cars: the player can set the ride time.

Spiral Slide.

Saucers: the player can set the ride time.

Motion Simulator: the player can select the intensity and ride time.

Space Rings: the player can set the ride time. The number of rings/size of ride can be specified.

Boat Hire. The player builds a dock section. The number and type of boats are then specified. Boat types can be: canoe, row boat, jet ski, water tricycle, bumper or swan pedal boat.

### **1.2.2.3.2 Tracked**

Tracked rides consist of trains, coasters, cars, arial trams and certain water rides. The player chooses one of these categories and then selects the ride type within the category. In each case, the player builds a station and then places track segments. The vehicle can be selected after a track has been built. Each piece will have a clearance requirement. The player will be notified if the a piece cannot be built due to inadequate clearance. The player can choose to automatically modify terrain to allow construction. Tunnels will be generated automatically when the piece approaches a surface with a angle of 45 degrees or less to the surface normal.

#### *1.2.2.3.2.1 Stations*

\*\*The player can build stations one segment at a time, [organically curve shaped](#) or by placing a large complete station all at once. [The station doesn't have to only be straight. It can also curve to any angle or even almost a full circle.](#) The size of the station can be selected before or after placement. Shortening a station will result in straight [or curved](#) track being added as needed. A station cannot be enlarged if there is no straight [or curved](#) track which can be removed to make room for it; the player will be advised of such a situation. Multiple stations can be constructed for a given ride. If desired, separate loading and unloading stations can be designated. Stations can be open or covered. Stations can have single, [double or multiple tracks](#) with optional switches at the end. The Launch mode for [multiple](#) stations can be set to simultaneous, alternating, or first available. The theme for the station can be specified at any time. A station will have a sign to display the name of the ride. The player can specify the name of the ride and have it appear at all stations for that ride. If desired, the player can give different names to individual stations. [Signs can be round, square or have tug points to shape them differently. a custom logo with a specified color background can also assume the shape of the imported graphic for a wild custom shaped sign.](#)

Music is played at the station as specified by the player.

Entry and exit points for the station can be specified. Turnstiles will appear automatically. The exit area does not require a special structure; it can be on the edge of a station that is adjacent to a path. The entry point will normally be connected to a queue path. [Multiple entry queues will also be available where passengers board for instance a coaster. An island for split rails can also be added with multi turnstiles, for example a flume station where passengers wait on a platform with a flume track on each side to board the ride or exit.](#)

The player can build stations one segment at a time or by placing a large complete station all at once. Stations can be made from straight or curved track segments. There is a minimum radius which can be used for a station. The size of the station can be selected before or after placement. Shortening a station will result in straight or curved track being added as needed. A station cannot be enlarged if there is no suitable track which can be removed to make room for it; the player will be advised of such a situation. Multiple stations can be constructed for a given ride. If desired, separate loading and unloading

stations can be designated. Stations can be open or covered. Stations can have single or double tracks with optional switches at the end. The Launch mode for double stations can be set to simultaneous, alternating, or first available. The theme for the station can be specified at any time. A station will have a sign to display the name of the ride. The player can specify the name of the ride and have it appear at all stations for that ride. If desired, the player can give different names to individual stations. Music is played at the station as specified by the player.

Entry and exit points for the station can be specified. Turnstiles will appear automatically. The exit area does not require a special structure; it can be on the edge of a station that is adjacent to a path. The entry point will normally be connected to a queue path.

#### ***1.2.2.3.2.2 Tracks***

Tracks are built out of segments. The player is presented with a selection of general track pieces and places them one at a time. The player can choose to modify any segment to better suit their design. To facilitate customization, when the player selects a track segment, they are presented with information about the length as well as the yaw, pitch and roll of the beginning and end of the piece.

Standard track pieces are: straight, horizontal curved, vertical sloped and special. Most pieces can be banked. Straight pieces have standard lengths of short (3 meters), medium (5 meters) and long (10 meters); the length can be adjusted after it is placed. The player has the option of snapping the length to 1 meter intervals while adjusting. The standard amount of banking is a multiple of 15 degrees (0, 15, 30, 45, 60, 75, 90, 105, 120, 135, 150, 165, 180) or a multiple of 22.5 degrees (0, 22.5, 45, 67.5, 90, 112.5, 135, 157.5, 180). The player can modify the banking of the beginning or end of a segment. The adjoining segment will be automatically modified as well. Note that a station requires a straight piece at entry and exit.

Horizontal curved pieces can be chosen with a radius of tight (1.5m), short (3m), medium (4.5), long (6m) or very long (7.5m). The amount of curvature can be chosen from 15, 22.5, 30, 45, 60, 67.5, 75 or 90 degrees. Horizontal curved pieces have the same banking options as straight pieces. The player can choose to modify the radius, curvature and banking after the piece has been built. The beginning of the segment will remain fixed while the end will change as the values are modified. If possible, the adjoining pieces will be modified to keep the track continuous. If the track will be broken, the player is warned. An undo feature is available.

Vertical slopes (curves) have the same standard radius and curvature options as the horizontal pieces. A segment can have both horizontal and vertical curvature as well as banking. Lift slopes cannot have banking. Chain lift slopes cannot have horizontal curves. Note: mini coasters may have powered vehicles that travel up low sloped helix shaped lift sections.

Special pieces simplify construction of some common complicated track elements. This includes small and large versions of a vertical loop, corkscrew, half loop and helix. There will also be a barrel roll, in line twist and a photo section.

Switches are a very special track piece. Switches cannot have banking or vertical slope. A switch has a straight section and either a left hand or right hand curved section. Note: although dual curved (both wye and cotangent) switches exist in real life, we will not implement them in this game. If a switch is convergent (two entry points and one exit) there is no additional complexity. If a switch is divergent (one entry and two exit points) then the player will have to specify how the direction decision is to be made. If a switch is used in a track with bidirectional vehicle flow, the divergent decision will have to be specified. The decision can be fixed, alternate, station availability dependent or time based. A fixed switch always goes in one direction. These are typically used for appearance only but the player may use this to allow a ride to operate while developing a new part of a track. An alternating switch will direct a vehicle to one exit and the next vehicle to the other exit. This is useful for dual stations operating in alternating mode. For stations operating with the first available mode, the station availability switch mode will allow vehicle to go to whichever station has the fewest vehicles waiting. The timed switch mode allows the decision to be based on time of day or time of year. The player can specify which times the vehicles should go straight and they will take the curve route at other times. This allows different routes at night or during winter for example. Note: the excitement ratings for a ride will depend on the route taken.

Steel tracks can be placed in shallow water. This creates a splash section. The player should be notified when a track segment will be under water.

The player can instruct the game to connect two track segments. Appropriate track will be created if possible. If not possible, the player will be informed. The track pieces placed automatically can be modified by the player like any other track pieces.

Ride events can be associated with a track segment. When a vehicle passes over the segment, the event will be activated. Ride events include animated scenery and audio messages.

#### ***1.2.2.3.2.3 Railroad Trains***

Railroads can be built as a loop or as an end to end system. If the ends are stubs, the engine will go in reverse. The player can also build a loop at an end and use a switch to join back to the line.

Narrow gauge: miniature steam engines can be either American or European style. Alternatively, single or double diesel engines can be used. If desired, a double end diesel can be used. The passenger cars are either open or closed and can be either wooden or steel. The player can select the number of cars. Another vehicle type is the tram which is always a single car. The player can set the maximum speed. The vehicle may go faster on down slopes.

Monorail: Normal or inverted tracks are available. Small or large monorail trains with one or more cars can be built. The player can specify the maximum speed.

Track types include straight, horizontal curved, vertical slopes, photo sections, gated crossing (for car tracks and foot paths) and switches. Crosses can also be used.

#### ***1.2.2.3.2.4 Coasters***

The coaster type is selected as either wood or steel. Wood tracks can be Standard, Side Friction or Flange. Steel tracks can be Dual or single and either Standard or Suspended. This refers to the orientation at the station. Once out of the station, any track type can be inverted. Either of these can have internal or external ties. Round or square center tubes are available. The player can change the track type after the ride is constructed. The support structure can be wood or steel. Steel supports can be lattice or post. Posts can be round or square. Standard coaster types will be available from a menu so that the player will not have to set each detail when they want a common coaster.

★ ★

The Coaster Analyzer is actually a fancy name for importer. This will allow the game logic to convert existing RCT1,2 and 3 tracks into TPB3D format. In addition it will also allow importation of "No Limits" based coaster tracks into the game by the user.

Vehicles can be conventional, articulated or trailer articulated. Suspended vehicles can be fixed or swinging. The player can specify the number of passengers per car and the number of cars in a train as well as the number of trains on a coaster. Vehicles can be changed after a coaster is constructed.

All stations contain brakes. A coaster may be power launched out of the station. It may be power launched forward or backward. Power launched rides may be set to allow the first contra flow passage to pass through the station without braking. The player can set the launch speed.

Track types include straight, horizontal curved, banked, vertical curved (slopes and loop elements), twist inversion, brakes, boosters, photo sections, lift chains and switches.

#### ***1.2.2.3.2.5 Cars***

The player can choose the body style for cars: Sports cars, Race cars, Trucks, Vintage cars and Go Carts. A loading station is built and then the track is laid. The track must complete a loop. Multiple stations can be used. The player can select the vehicle speed.

Track types include straight, horizontal curved, vertical slopes, photo sections, gated railroad crossing and switches. Go Cart tracks can have crosses.

#### ***1.2.2.3.2.6 Ariel Tram***

The Aerial tram can be either a loop or an end to end track. There can be one or multiple stations. The terminal point can be either a station or a turntable. The player can select the vehicle as a gondola (squared, round bucket with roof, or bubble), a ski lift chair (single, double, triple or quadruple seat) or a large aerial tramway. The player can select the travel speed.

Track types include end piece, straight, horizontal curved and vertical slopes. The end piece is a turntable which lets the cars move in a semicircle to return to the station. Vertical slopes allow the cable (track) to change vertical angle. Horizontal curves allow the track to change horizontal angle by an amount specified by the player. A horizontal curve and vertical slope can be combined into a single track segment. Turntables, horizontal curves and vertical slopes each require a support post. Straight pieces span the distance between those special pieces. Support posts are auto generated if the span is greater than ten tiles. The player can choose to place support posts manually. Manually and auto generated posts are flagged internally so that the game can remove an auto generated post if a manually placed post makes it unnecessary.

Each station has engine noise for ride. This is only found at station. Additional ride noises occur when the car is on the cable (whizzing noise, very slight) or where the cable the car is attached to passes over a tower support and the bogey wheels that move the ride along (thump thump noise, slight).

#### 881.2.2.3.2.6 Aerial Tram - Propose Change to **Aerial Rides**

The Aerial tram can be either a loop or an end to end track. There can be multiple stations or a single station that has a turntable at the end of the ride that redirects the car back to the original station. The player can select the vehicle as either a gondola (Squared, Round Bucket with Roof, Bubble), a ski lift chair (Single Seat, Double Seat, Three Seater or Quad seat) style or a large Aerial Tramway. The player can select the travel speed.

*Track types include end piece, straight, horizontal curved and vertical slopes. Should be Track Types include Station (covered and auto-themed, uncovered), Entry Tower Support, Exit Tower Support, Straight Piece (can be raised, lowered, curved around at any angle) End Turn table automatic for single station up & back operation.*

*Supports for the straight piece automatically appear and adjust to height and position of straight piece when raised, lowered and bent at other angles. Ride builder can add, delete and reposition supports.*

*The track can be stretched, bent at any angle, risen or lowered at any point out of that station. The ride can travel in any direction. Raising or lowering the wires causes auto-strut supports to also adjust. Stretching the length also adds new support struts or towers depending on the style selected by the ride builder.*

*(Aerial Tramway not included) Attendants at the ride station(s) facilitate passengers loading and unloading. The exit station is placed where the ride car first enters the station. Passengers offload here. Car goes around turntable and then this is where the turnstiles for ride entry are placed. Passengers are assisted in entering ride at this point.*

Each station has engine noise for ride. This is only found at station. Additional ride noises occur when the car is on the cable (whizzing noise, very slight) or where the cable the car is attached to passes over a tower support and the bogey wheels that move the ride along (thump thump noise, slight).

#### ***1.2.2.3.2.7 Water Rides***

Log flume and River Ride: these are coasting rides. The River Ride track is wider and the boats are larger. The player can set the speed of the lift hill. Multiple stations can be used. The track must make a loop. Track types include straight, horizontal curved, vertical down slopes, lift slopes, photo section and switches.

Water Slide: this is a coasting ride. Multiple stations can be used. The track must make a loop. The player can set the speed of the lift hill. Track types include straight, horizontal curved, banked, vertical slopes, lift slopes and photo section.

Journey Boat: this powered vehicle follows a track that is underwater. There can be multiple stations. The player can set the speed of the boat. The speed is associated with the track so that different sections of the ride can have different speeds. Track types include straight, horizontal curved, photo section and switches. Crosses can be used.

**\*\*Giant Surfer Wave Machine:** Arched large ride where people get their surf and boogie boards and a lot of water is wave curled so they can surf on a actual wave of water. If they wipe out, they get shot forward to the shallow end usually 3 feet deep or about 1 meter, and then they just go to the back and entry of the machine to launch and go surfing once again.

**Giant Surfer Wave Machine Surf Shop:** People get their surfboards or boogie boards (set by park admin) and also emerge in swimsuits. When finished with this attraction they must go back through the Surf Shop to surrender their board and become changed into their clothing again. *(Special note, this attraction can be placed near a pool and guests will use the changing room to also acquire boards)*

**Swimming Pool:** The user can create a swimming pool and it can be done on or off the grid. Pool edges can be tugged, adjusted and even curved. Paths around pools adjust to the curvature of the pool itself. Once the shape of the pool has been laid out, points in the shape can then be raised or lowered for the depth of the pool at that area. Once a pool has been completed it then gets water in which case it becomes fully functional. The pool can then be saved and traded with others who may use it in their parks. Pool paths can also utilize points to wide or narrow the path around the pool.

**Pool Slide:** Many varieties of water slides for swimming pools can be utilized and built. These are special slides that are stuck to pool areas. The slide must always end over a water area to be completed though the entry for a waterslide can exist anywhere. Slides are themselves part of the pool area and thus are not considered separate attractions.

Pool Accessories: Standard Diving Board and than multiheight Diving Boards, Showers Indoor/Outdoor, Pool Restrooms, Pool Dressing Rooms, Pool Ladder to assist those getting out of the water, Wave machine for pool - placed on the side near the deep end of the pool (Note wave machines can be adjusted), Whirlpool Machine placed on the bottom of the pool - spins guests in the pool as they float over it, Lounge Chairs, Lounge Chairs with Umbrella, Pool Table and Chair set for serving food on.

Pool Employee: Lifeguard and chair. Note a pool must have a lifeguard on duty in case People have complications. The lifeguard will also remove any pool offenders too.

People: People visiting the pool enter the changing room and come out with swimsuits.

People Pool Additions: Innertube, Misc. Plastic Inflatables (dinosaur, mattress, sea horse, aligator etc.), Floating Lounger Chair with cup holder (for adults)

People Pool Water Toys: Super Soaking Gun, Dip Stick, Water Balloon Bombs (Note that People caught using these in the pool get kicked out by the Lifeguard, as these toys are only for usage at poolside)

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### **1.2.2.3.3 Shop**

#### ***1.2.2.3.3.1 Stalls***

Stalls are simple shops that allow the guests to buy things over a counter. The player can set prices and select which items are available. In addition, a variety of shapes are available for the stall. Stalls can be themed or generic. They are placed beside a path. The path automatically extends to the counter. If a stall is placed next to a path and there is only one way the stall can face, it will automatically be rotated to the appropriate direction. Once placed, a stall can be rotated by the player. A food stall can sell any combination of food and drink items, but is limited to four items. In addition to food, there are souvenir and service stalls.

#### ***1.2.2.3.3.2 Stores***

Stores are larger buildings which guests can enter. These are constructed by use of the building generator described later. Once a building is constructed and a floor designated as a store, the player can select the between a restaurant (food and drink items) or a souvenir store. Any number of food and drink items can be selected for a restaurant. Similarly, a souvenir store can sell any number of souvenir items.

#### ***1.2.2.3.3.3 Items***

\*\*Food items include burgers, hot dogs, fries, cotton candy, ice cream, pizza, popcorn, fried chicken, cookies, sandwiches, donuts, funnel cakes, pretzels and soup.

\*Drink items include colas, lemonade, hot chocolate, coffee, ice tea, milk, [milkshakes](#), and bottled water. Coffee can come in different styles with high prices which the adult guests seem to pay no matter what. [Milk and Milkshakes can come in Chocolate, Plain/Vanilla, and Strawberry](#)

\*Souvenir items include balloons, t-shirts, hats, glasses, [umbrellas](#) and stuffed toys (dolls).

\*Service stalls include information (maps), restroom, ATM and first aid.

\*[Custom Items may be made by the player or outside sources and added into the game.](#)

Food items include burgers, hot dogs, fries, cotton candy, ice cream, pizza, popcorn, fried chicken, cookies, sandwiches, donuts, funnel cakes, pretzels and soup.

Drink items include colas, lemonade, hot chocolate, coffee, flavored coffee, ice tea, milk, milkshakes and bottled water. Flavored coffee costs much more but the adult guests seem to pay no matter what.

Souvenir items include balloons, t-shirts, hats, glasses, umbrellas, ponchos and stuffed toys (dolls).

Service stalls include information (maps), restroom, ATM and first aid.

## 1.2.2.3.4 Show

### 1.2.2.3.4.1 Audience

Audience shows consist of a performance stage and an audience area. The player can specify the size of the audience area which determines the number of guests that can attend the show. The audience area can be open or covered. The audience area can be edited after the show is constructed.

Circus: a circus has animal and human acts. The player can create a sequence of acts by selecting items from a list. A sequence will be created by default if the player does not make their own. Animal acts are lion tamer, elephants, seals and horses. Human acts are clown car, acrobats, jugglers, sword swallower and cannonball.

3D Cinema: the performance stage for a 3D cinema is the ceiling. The player can select a length for the performance.

Concert: The player can specify the size of the performance stage and the number of performers. The player can create a sequence of songs to be played. The songs will be actual audio pieces. The player can create a sequence of actions for the performers or allow a random sequence to be used. The performer acts stop when a song completes. The action sequence can be specified for each song in the list. Performers can be assigned

to drums, guitar, horn or singer. Action sequence can be play instrument, smash instrument, run, jump, flip or gesture. The stage can be themed.

Magic: The player can create a sequence of magic acts by selecting items from a list. A sequence will be created by default. Magic acts are levitation, saw in half, rabbit in hat and doves.

#### **1.2.2.3.4.2 Tour**

Tour shows are placed like flat rides. These are fixed buildings which cannot be modified except for theming. The player can specify a time duration, tour size and the admission price.

Haunted House, Crooked House and Fun House are available tour shows.

### **1.2.2.3.5 Midway**

Midway game areas can be placed by selecting from a menu. The particular game can be changed after the area is placed. The player can choose to enter the game. This will suspend regular game play and launch a special program. Midway games will be downloadable as additions. Standard midway games will be ring toss, water guns/balloon pop, “whack-a-mole”, pinball and milk can/ball throw.

## **1.2.2.4 Scenery**

### **1.2.2.4.1 Building**

**\*\*All scenery can be rotated and resized arbitrarily. The rotation and size can also be changed easily later. When resizing groups the player can choose whether the resize only affects the space between the contents or the contents themselves as well.**

#### **1.2.2.4.1.1 Components**

There are two methods of creating “buildings”. A building can be composed of many small pieces which the user places in their desired configuration. Such buildings are purely for scenery purposes. Wall sections of varying heights and some with windows and doors will be available through a menu. A variety of roof pieces will also be available. These items can be modified by changing the associated texture. Custom pieces can also be made and imported into the game as scenery items. The player can elevate these components above the surface. The height and rotation of a piece can be modified after it is placed. A group of building components can be saved as a file.

#### **1.2.2.4.1.2 Generator**

In addition to using the traditional method above, a special “building generator” editor enables the player to swiftly make complete buildings. These can be simple shell

structures such as ride covers and scenery items, or they can be more complicated buildings such as multi floor shops and restaurants. These latter items have functionality beyond scenery items. The player chooses a wall and roof type, and specifies the window and door pattern. Wall and roof component structures can be custom made and imported. The texture applied to the components can be selected. Different textures apply to the inside walls.

The player first specifies a building outline. This can be square, rectangular, triangular, pentagonal, round, elliptical or custom. A custom outline is drawn as segments of straight lines and arcs. The outline cannot intersect itself. The player can instruct the program to automatically make the last segment to complete the outline. The player must specify a door location for the building. Windows can be individually located or flagged as either none or automatic creation.

The player can then assign wall types for each segment individually or specify one type for the entire building. The player specifies a roof type. The roof can be flat, pointed or angled. The program will determine the slope boundaries automatically. Alternatively, the player can specify point and angle peaks superimposed over the floor outline.

Buildings, once placed, can be expanded upon using building pieces. These pieces snap perpendicular to existing walls unless specified otherwise, allowing for embellishments such as chimneys, turrets, hanging signs etc. to be added.

A building can be a large cover of a multiple floor structure. Large cover buildings can be designated as “dark” or “light”. Dark buildings will not have internal lighting. They are typically used to house rides with animated and lighted scenery.

\*The number of floors can be specified. Each floor can be designated for a particular usage. Available usages are: restaurant, show (comedy, magic, musical), shopping, lodging, business offices. The usage can be edited as desired. Pricing can be specified. The game will automatically generate all items associated with a given usage. Restrooms within a building are [optionally](#) only available to patrons. Stairs between floors will be automatically generated. Buildings can be saved and subsequently placed as complete units. An elevator can be placed in building; landings will be automatically created at the floors.

The number of floors can be specified. Each floor can be designated for a particular usage. Available usages are: restaurant, show (comedy, magic, musical), shopping, lodging, business offices. The usage can be edited as desired. Pricing can be specified. The game will automatically generate all items associated with a given usage. Stairs between floors will be automatically generated. Buildings can be saved and subsequently placed as complete units. An elevator can be placed in building; landings will be automatically created at the floors.

\*Buildings, once placed, can be expanded upon using building pieces. These pieces snap perpendicular to existing walls unless specified otherwise, allowing for embellishments such as chimneys, turrets, hanging signs etc. to be added. These additions can effect the popularity of a building, but do not alter it's function or

interior size Buildings can be saved as entire structures. Buildings can be placed on top on an existing building.

## 1.2.2.4.2 Stationary

### 1.2.2.4.2.1 Nature

The player can choose to place stationary scenery items. These include nature items (trees, shrubs, stumps and rocks), statues, fences and walls. Stationary scenery items are always built on top of the item at the designated location. Most of the time this will simply be the terrain surface. The player can select a group of nature items and have them scattered over a designated area. The size and shape of the area can be specified. The density of items to be placed in the area can be specified.

### 1.2.2.4.2.2 Statues

Statues can be selected from a theme group. Statue objects can automatically remove nature items that are in the way when they are built. Once placed, a statue can be rotated. Some items will have custom color components that the player can modify. New theme groups can be downloaded as they become available.

### 1.2.2.4.2.3 Barriers

Fences and walls can be chosen from some standard items or from a theme group. They can be placed individually or by specifying a start and end point.

\*\*or they can be combined into a single unit. As a single larger unit, multiple scenery items get a new rotation point at their center which can be adjusted for rotational aspects of the newly joined scenery pieces. In addition the old piece(s) also retain their rotational point at the joint of the other piece they are attached too.

## 1.2.2.4.3 Animated

Animated scenery items are cyclic, triggered or scripted. These items are selected from a menu and may be part of a theme group. They are placed similar to stationary scenery items. They can be rotated after being placed.

### 1.2.2.4.3.1 Cyclic

Cyclic items include water fountains, waterfalls, signs, animatronics and terrain effects. Water fountains include containerized fountains and spray jets which are typically placed in bodies of water. Note: spray jets can also be triggered items as described below. Waterfalls can be draped over a sloping terrain or can be vertical free standing sheets of falling water. There does not have to be water at the beginning (source) or end (drain) of a waterfall. The player has the responsibility to make waterfalls look like they belong. The speed of falling water will depend on the slope angle and the scenario's gravity value. The width of a waterfall can be modified.

Animatronic scenery items are statues that follow an action sequence. The sequence does not have to feature continuous action, but the sequence follows a fixed time schedule and repeats continuously. The player cannot modify the sequence. The item can be rotated after it has been placed. These items are typically part of theme groups. Note: some animatronic objects can also be triggered items as described below.

Text Signs feature scrolling text. The player can specify the text to display. The scroll speed is fixed but the player can turn off scrolling. Signs can be moved after they are placed.

Terrain effects include bubbling mud in selectable colors and glowing lava. These effects are draped over the terrain surface.

#### ***1.2.2.4.3.2 Triggered (Ride events)***

Triggered scenery items are placed where desired and also need to be associated with a particular track segment of some ride or a section of path (walkway). These items can be moved and rotated after they are placed. The trigger track (path section) can be changed as desired. There are no other settings for these objects. They are typically chosen from theme groups. The triggering event occurs when a vehicle (or guest) enters the trigger section.

A speaker is a special type of item. It plays an audio recording rather than displaying an animation. The player can select the recording to be played. The recording can be selected from a list or can be a custom sound. A sequence of sounds can be specified.

#### ***1.2.2.4.3.3 Scripted (fireworks)***

Scripted scenery items are designed by the player. The player selects music to be played and a combination of display sequences. The player also specifies the time for the show to play. A miniature display is presented to allow the player to preview the show. The player has to place a fireworks station somewhere in the park (above ground).

### **1.2.2.4.4 Groups**

The player can select several scenery items (of all types) and declare them to be a group. The group can then be moved as a whole. Groups can be saved and loaded as distinct entities.

## **1.2.3 Management**

The player's main activities revolve around construction. However, the player will also need to manage employees and finances. These are not particularly fun tasks so they are designed to be as painless as possible.

## **1.2.3.1 Employees**

The player will need to hire mechanics and janitors. Entertainers and security guards are also available. All of these are hired from a menu. There are no skill levels or training required. The player selects a new employee type to hire and then places them in the park. To fire an employee, the player selects them and issues a dismissal command. The employee then disappears.

Employees can be allowed to roam freely or they can be tethered to a desired location. Mechanics and entertainers can be assigned to work on a single ride, or they can be restricted to stay within a specified distance of a designated point. Janitors and security guards can be allowed to roam or they can be restricted about a designated point.

The player can make a global setting to assign a mechanic to each ride. In that case, when a new ride is built, a mechanic will be automatically hired and assigned to the ride. When a ride is deleted, the mechanic assigned to it is automatically fired, irregardless of this setting.

## **1.2.3.2 Finances**

### **1.2.3.2.1 Loan**

The player can borrow money to finance their park. The maximum loan amount is determined by the park progress. The previous loan history also affects the maximum loan amount. A steadily progressing park that does not miss loan payments can borrow increasing amounts of money. The interest rate is similarly affected. Loan payments will be made on an automatic monthly basis unless the player has no money at the time. When money becomes available, the missed payment will be made.

### **1.2.3.2.2 Advertise**

The player can advertise their park to increase visitors and attract VIP's. Local advertisement in papers, radio and television will increase visitors for the least cost. National advertisement in magazines, radio and television cost more but attract VIP's. When a VIP visits a park, regular visitors will increase for a while afterward. This offsets the high cost of attracting VIP's.

The player selects the medium for advertisement and selects the available package by price. The advertisement can be specified as a single event or a recurring expense. Recurrent advertising can be canceled when desired.

### **1.2.3.2.3 Prices**

Every construction item has an associated cost. Note: the player may choose to play without the financial model active. (They would still need to advertise to attract VIP's.)

Costs are relative and scaled based on the currency unit selected. The exchange rates can be updated periodically as desired.

Track prices are based on the track type, the size of the piece and the height above ground or depth below ground. Flat rides have a fixed price for each available configuration. Changing the theme of an item carries a small expense. Stations are a small expense added onto the track price. Path price is based on size of piece and height above or depth below ground. Building over water carries an extra expense for all items. Deleting a piece recovers all of the expense. The prices will need to be balanced so that a player cannot make money by building a track piece, changing the terrain and then deleting the track piece and then changing the terrain back.

Scenery items have a fixed cost to construct. The cost is based primarily on overall size. There is no charge for moving or rotating an object.

Terrain modification has a cost depending on the volume being modified. The cost of modifying the surface is modest. The cost of building underground is higher. Placing water has a modest cost. Changing the terrain type has a small cost. Terrain modifications should not charge the player if they undo their edits.

Rides, shops and shows have an operating expense which is independent of the ride cost. Animatronic scenery has a small operating expense. Water fountains also have a small operating expense. The park will pay a property tax based on its size. Land can be purchased or sold at fixed prices.

The player can charge for park admission and or ride admission. Shop items have adjustable prices. These prices can be changed at any time. When guests use an ATM machine, a fee is collected by the park. The player has the option of setting all charges to a master pricing scheme. If activated, the player chooses from generous, average or gouge. The game will then automatically set charges for all items and adjust them as needed.

Employee salaries are fixed.

## **1.2.4 Observation**

### **1.2.4.1 Viewing**

#### **1.2.4.1.1 Builder**

Most of the player's time will be spent in Builder view. The player can control the zoom as well as the horizontal and vertical angle of the viewpoint. This can be done with either the keyboard or the mouse. The player can move around in the park by use of either keyboard or mouse usage. The key mappings can be changed via settings. As the player

moves around the park, sounds generated in the park will be heard in a correct spatial distribution.

### **1.2.4.1.2 Ride**

The player can activate a ride camera. This displays the view from one of the guest seats. The player can step through the vehicles and seats. The ride view can be entered or exited at anytime. Ride view is entered by first selecting a ride and then activating a command. Upon exiting, the view returns to builder mode looking at the ride station where the player entered the ride view.

### **1.2.4.1.3 Guest**

The player can assume the role of a guest in the park. An existing guest can be selected or a special guest can be created. The special guest can be a higher polygon model than normal guests. The player can customize this model as described later in the Create: Guest section. Typically, players will customize the special guest to look like themselves.

When in guest mode, the player will see the park from the perspective of a guest. The player will control movement of the guest. The guest characteristics will be displayed during this mode.

The player can select objectives from a map or by clicking on nearby items such as rides and shops. The guest will proceed to the objective until it is reached or the player issues a new command. The player can purchase shop items and enter shows and rides. The guest cannot exit the park while this mode is active. The mode can be exited at any time. If the guest was on a ride, the player view will return to builder mode looking at the ride station where the player entered the ride.

### **1.2.4.1.4 Snapshots**

The player can take snapshots of the screen at any time. Photo sections on rides will take a snapshot automatically. The player can inspect these by selecting a ride from a list or by selecting a particular ride and choosing view photo from an option for that ride.

### **1.2.4.1.5 Balloon Mode Cam**

The Player can visit in multimode as a balloon. This camera has a bobbing effect and rotates freely. The player in balloon mode can attach themselves in multiplayer mode to another player. If the balloon mode is enabled and the player travels with another player, they are safe. If the player in balloon mode is not attached to another player or is let go by another player they were with, they can be popped by the other players in which case they would have to relogin to the game. During this period the cam for the balloon player would automatically be deactivated and would reactivate once the player re-logged into the multiplayer game set.

## **1.2.4.2 Maps**

The player can activate a map to evaluate some characteristics of the park. These maps can help identify trouble areas as well as indicate successful areas. Maps are shown as top down views. By clicking on a map, the game view will be moved to that area.

### **1.2.4.2.1 Property**

A property map shows the park boundaries and the structures built within in. The player can toggle on or off display of paths, scenery, buildings, flat rides, tracked rides and shops. Each of those items can be color coded. Alternatively, the player can select to view a property value display where a color code is used to indicate value.

### **1.2.4.2.2 Popularity**

A popularity map uses a color code to indicate the popularity of rides and shops in the park. The player can toggle on or off flat rides, tracked rides or shops. The player can select to display the popularity based on guest ages. At least one age range must be selected. Areas which contain rides but are unpopular should inform the player as to why there is a problem. Common problems are lack of ride diversity, lack of shops, lack of facilities and excessive prices. Very popular areas should inform the player as to why they are successful. Common reasons are low prices, quick lines, good scenery and diverse rides densely placed.

### **1.2.4.2.3 Profit**

A profit map indicates where money is being made and where it is being lost. The view scale can be adjusted to provide the desired resolution. Employee expenses are incorporated only for employees that are assigned to specific rides.

### **1.2.4.2.4 Traffic**

A traffic map shows the density of foot traffic through the park. A color code is used.

### **1.2.4.2.5 Themes**

A theme map shows the density of themed scenery. The effect of the themes on the guests can also be displayed. Different themes can be color coded. The player can also use this map to automatically apply a theme to a region of the park. A theme is selected from a list and then an area of the park is selected. Any item in that area that can be converted to the new theme is automatically changed.

### **1.2.4.2.6 Souvenir**

\*A player can generate a souvenir map. This map has a "Legend" title for the park and has the (note: always) entrances at the bottom. The map size and quality can be specified by the player. A Souvenir map lists all the rides, sections and shops and rides within those sections at the bottom. It generates an overview of the entire park.

This map can also be exported as an html page. This can be used to guide players for an online game of the park. Users can click a link in the Souvenir map and be taken to the exact point in the park.

## **1.2.4.3 Charts**

### **1.2.4.3.1 Finances**

A financial chart displays expenses and profits of rides, employees, shops, land and loan. In addition to viewing numbers, the player can choose to view line graphs.

### **1.2.4.3.2 Attendance**

An attendance chart displays the park attendance over time. Total attendance as well as age group views are available. Length of stay versus time of arrival can be viewed. Satisfaction versus time of arrival can be displayed.

### **1.2.4.3.3 Historical**

Major events in the park are marked in historical sequence in this chart. Some major events are park opening, VIP visits, one thousandth guest, loan payoff, large coaster openings and large park expansions.

## **1.2.5 Create**

### **1.2.5.1 Scenario**

The player can create scenarios by starting with a landscape and building as much of a park as they like. The scenario objectives and conditions can be specified.

The landscape is computer generated and then modified as desired by the player. Landscape choices are beach, flat, hilly, mountains, valley, canyon, and mesa.

The initial cash and loan amount can be specified. The weather conditions can be specified. Guest parameters can be set. A description can be added to the scenario. There are no specific objectives, conditions or rewards associated with scenarios.

## **1.2.5.2 Scenery**

Players may choose to create their own scenery objects for use in the game. They will have to use a 3D-modeler program to create the scenery object. They can import a 3ds file. The imported object will be converted for use in the program and will be assigned a GUID. The player will be warned if the object seems to have excessive complexity for its overall size.

## **1.2.5.3 Theme**

A player can assign a collection of scenery objects as a specific theme group. They name the theme and select items to be included. The theme group can be saved.

## **1.2.5.4 Guest**

A player can create a custom guest. A special guest model is used. Basic features of the model can be modified such as height, physique (fat, normal, skinny, muscular), hair style, hair color, eye color and skin color. The player can import an image file to use for the face. Clothing styles can be chosen from a list. All of these changes are presented for review before the custom guest is saved.

## **1.2.5.5 Building**

Buildings can be generated as described earlier. In addition, a collection of generated buildings and scenery can be selected to save as a single large building. For example, generated buildings could be stacked and have an elevator placed. This whole group could become a single building. A large building can be named.

## **1.2.5.6 Vehicles**

Players can create custom tracked ride vehicles. The track type is specified. The track type automatically determines the wheel assembly to be used. Then the player chooses between conventional, articulated or trailer articulated trains. The number of seats is specified. Then the player can import a 3d-model file to represent the vehicle. The position of the model, wheels and seats can be adjusted. The completed vehicle can be saved as a file.

## **1.2.5.7 Flat Ride** **\*\*** *Construction Set (FRCS)*

A special screen is available for creating custom flat rides. The player creates a flat ride by specifying a base, primary mechanical structure, optional secondary mechanical structures, optional addition structures and a motion control sequence. Some rides can be scaled in size. The player can activate an evaluation to demonstrate the ride. The ride will

undergo automatic evaluation before it can be used. The automatic evaluation checks for collisions and g-forces.

### **1.2.5.7.1 Base**

The player selects a base shape and size. These choices can be changed at any time, but must remain large enough for the operating ride to remain within the perimeter. Base shapes available are rectangle, square, ellipse, circle, hexagon and octagon. The size can be varied continuously or the size can be “snapped” to standard grid outline sizes. Rectangles and ellipses allow two dimensions to be sized independently.

Some rides can be scaled. For those cases, the base may need to be scaled also. The player will specify a scale factor for the base.

### **1.2.5.7.2 Primary Motion Structure**

The primary motion structure is the mechanism that moves the guests. It is the main feature of the ride. There are several mechanical components that are used to make this structure. They are arranged in a hierarchical pattern that includes repetition information. Components have individual properties. Components may also have interactive properties for motion control. The hierarchical arrangement of mechanical components with their properties and motion control description will completely determine how the ride moves guests.

Guest loading and unloading typically requires additional structures. Purely decorative items may be included in the primary structure.

#### ***1.2.5.7.2.1 Components***

Structure components are struts, rotation axes, linear actuators and carriages (where guests sit or stand):

##### **1.2.5.7.2.1.1 Strut**

###### ***1.2.5.7.2.1.1.1 Simple***

Struts are rigid pieces used to connect other items together. Connections are made only to the ends of a strut. Struts can be solid or lattice construction. Struts can be round, square or rectangular in cross section. The cross section can be tapered or fixed. The taper can be outward or inward. The length of a strut can be changed. A strut can be straight, bent or curved.

A texture can be applied to a strut. A 3d model can be imported and used as a strut by specifying the proximal and distal connection points. A light strip can be added to a strut.

###### ***1.2.5.7.2.1.1.2 Rod***

A variation of a simple strut is the rod. This can represent rope, cable or thin rod, with textures making the visual appearance distinct. Ropes and cables in the ride design will not deform like real ropes and cables would. Instead, they will remain straight rods that merely look like ropes or cables.

A special optional characteristic of rods is that they can have a dynamically varying length. They can be used as powered linear actuators or can slide freely. The minimum and maximum lengths can be specified. A driven (powered) linear actuators is identified as LAD and a sliding linear rod is identified as LAS.

#### *1.2.5.7.2.1.1.3 V strut*

A vee strut has is composed of two identical strut pieces which have a common connection point on one end. The other ends are separated. The player can specify the angle of separation. The common point can be either the proximal or distal connection point. A common use of V struts is to support a dual end horizontal axis above a base.

#### *1.2.5.7.2.1.1.4 Strut Complex*

A common feature of mechanical ride assemblies is a symmetric strut complex. The simplest example is a bar that is connected to a driven axis at its center and has identical attachments at each end. This would be described as a pair of symmetric struts. The player merely has to specify that a strut is complex and indicate how many times the piece is spawned. The player can select any individual piece to edit the complex. Each member of the complex will be updated as changes are made. In the hierarchy diagram (discussed below), strut complexes are indicated as a single strut definition and an arrow with a number indicated the number of struts in the complex.

#### *1.2.5.7.2.1.1.5 Disc*

A disc is a special type of strut complex. The proximal connection point of a disc is at its center. The distal connections are arranged along the perimeter – or may be at a lesser radius. The player specifies the disc radius, number of divisions and distal connection radius if applicable. There is also an option to specify multiple radii for distal connections. The divisions can be symmetric or paired symmetric. Paired symmetric divisions have a fixed spacing between two (paired) connections while the spacing between the pairs can change as the number of total divisions or disc size are changed.

#### *1.2.5.7.2.1.2 Rotation Axes*

Most flat rides involve rotation. We use the term axis to refer to the point where rotation takes place. Axes are usually connected to struts. An axis can be in line with a supporting strut in which case it is referred to as an Inline Axis (I). If the axis is oriented at a right angle to the strut, it is referred to as an Orthogonal Axis (O). If the rotation about an axis is powered, it is referred to as being a Driven axis (D). If it is not powered, then motion occurs due to inertia and gravity. In that case, the axis is referred to as a Free axis (F). A rotation axis is described by its connection to the distal end of a strut, its connection to

the following strut and whether or not it is powered. Thus the eight types of rotation (R) joints are RIID, RIIF, RIOD, RIOF, ROOD, ROOF, ROID and ROIF. A disc strut will always have an inline axis at its center by definition.

The drive pattern will be described under motion control. Motion can be unidirectional or bi-directional. A hinge axis can be ratcheted to allow rotation in only one direction. Driven motion can be arcs or full circles.

A special type of rotation occurs at ball joints. These are not driven. They allow motion at any angle. These are identified as RFF (rotary joint free hanging proximal and distal) on diagrams.

#### 1.2.5.7.2.1.3 Carriage

Usually, at the furthest end of mechanical structures there will be carriages for the guests. Some rides will have only one carriage. A carriage can hold one or more guests. Some standard carriage designs are available for the player. Alternatively, a 3d model file may be imported for the carriage. In the case of an imported file, the player will need to indicate the location of the seats/spots where guests will ride. The player will also indicate the attachment point(s) where the carriage attaches to struts. The attachment is inherently rigid.

#### 1.2.5.7.2.1.4 Decorations

Decorations can be placed on the primary motion structure. These are essentially scenery items that are attached to struts.

#### ***1.2.5.7.2.2 Hierarchy Diagram***

A hierarchy diagram defines the motion structure. Horizontal arrows indicate simple mechanical connections. A Vertical down arrows indicates symmetric duplication of components. For example, a scrambler ride consists of a rotation axis that has a hub with three arms, each of which has a rotation axis that also has three arms. A simplified diagram for such a ride would be:

Base → strut → RIOD

↓ (x3)

strut → ROOD

↓ (x3)

strut → carriage

Each component in the hierarchy diagram has several properties. These will be displayed to the player as well as being editable.

An Enterprise ride has a horizontal axis which connects a large strut to a driven vertical axis. A large disc spins about this axis and has free hanging carriages on the edge of the disc. A simplified diagram for an Enterprise ride is:

ROOD → strut → ROID



Disc(32) → ROOF → carriage

In this case, a disc with 32 segments is used. A hinged axis (ROOF) allows the carriage to hang freely. The motion control system would describe (among other details) how the driven horizontal axis moves in an arc when the disc is spinning fast enough.

Some rides require recombining structures that have been previously divided. An example of this is the Magic Carpet ride. This has four rotating struts which all connect to a single large carriage. A *recombination* is diagrammed with an up pointing vertical arrow as demonstrated below.

Base carriage

↓ (x4)

↑ (x4)

strut → ROOD → strut → ROOF

Items in the diagram can be added, inserted and deleted. An undo command is available.

### 1.2.5.7.2.3 Properties

#### 1.2.5.7.2.3.1 Individual

Items in the diagram have individual properties. These properties can be viewed and edited as desired. The edits will result in immediate change of the viewable ride model.

#### 1.2.5.7.2.3.2 Combined

Items in the diagram can be linked so that they have common properties. Rotary motions can be linked to each other in a ratio. For example, the second driven rotary axis of the scrambler ride could be specified to rotate 2.5 times for each rotation of the first driven rotary axis. Lengths can also be linked.

### 1.2.5.7.3 Secondary Motion Structure(s)

Some rides will make use of secondary motion structures. These do not attach to carriages. They are sometimes used to provide retractable loading access. Secondary motion structures are described by use of a hierarchy diagram similar to primary motion

structures. There can be more than one secondary motion structure. Items in secondary structures can be linked to items in the primary structure or to items in other secondary structures.

#### **1.2.5.7.4 Ancillary Structures**

A ride may need stationary items to complete the appearance. These can be imported as 3d models. These can also be built from scenery items.

#### **1.2.5.7.5 Motion Control**

Each driven axis or rod must have its motion sequence specified. If a driven element is linked to other item(s), one and only one element of the linkage will have a motion sequence specified. There will be a loading sequence, an operating sequence and an unloading sequence. If desired, the unloading sequence can be declared the same as the loading sequence and need not be separately described. Some rides will not require any motion for the loading sequence. A driven item will have its motion indicated on a control diagram.

The control diagram displays time on the horizontal axis. Each driven item has a plot on the diagram. For rotations, the direction is indicated by clockwise motion being above the axis and counter clockwise motion below the axis. The distance from the axis indicates the speed. Thus, the speed, ramp and duration of rotations will be clearly visible. Linear drive items will be displayed as extension (0 to 100%) versus time. The player can specify trapezoid and sinusoidal curves to describe the motions. Once placed, the curves can be stretched to resize them. The curves can be deleted if desired.

Motion testing of the complete ride will use a special evaluation mode. This mode uses careful collision detection to determine if the ride is viable. The total number of polygons for the ride will also be evaluated.

#### **1.2.5.7.6 Additional Information**

Some additional information will be associated with a custom ride. The creator can include some text to describe the ride. The operating costs and purchase cost will be estimated automatically and need not be specified. The motion of guests to approach and leave the carriages must be specified. This is done on a top down view of a map of the ride and base. The loading entry points are specified and line paths to the edge of the base are indicated. A walk around loop must be specified. Note: entry and exit points can be placed anywhere along the base edge of any flat ride.

## **1.2.6 Internet**

### **1.2.6.1 File Exchange**

Players will be able to access the main web site from within the game. The player can peruse custom content which is available for download. The player can also upload their own custom content. Files will be automatically placed in the appropriate directories. All custom files will contain GUID's. File names may be modified if needed. The content name and ID will be the method by which the player identifies and selects items.

### **1.2.6.2 Multiplayer**

#### **1.2.6.2.1 Lobby**

Players can access the main web site to check for available multiplayer games. There will be a lobby where players can wait for someone to play with. When a group of two or more have decided to play together, one of the player's computer will become the host for the group. Further multiuser play will be conducted between these players independent of the main web site.

#### **1.2.6.2.2 Activities**

When participating in a multiplayer game, only the Guest view mode is available. Park management, building, weather settings etc. are not accessible. Players can communicate with each other by messages. They can see a display of the characteristics of the character representing each online player.

Players choose a guest to play in the shared game. They can use a custom guest that they have created. The custom guest files will be shared among all online players.

In game photos can be taken. On ride photos can also be saved if desired.

When a player quits, their custom guest will disappear for the remaining players. If the host player quits, the online game terminates for everyone. Upon termination of an online game, a player is returned to the standard game menu.

### **1.2.6.3 Update**

The player can access the main web site to check for updates to the game. Updates can be code patches or official content packages. Official packages are collections of user submitted items which have been reviewed and placed in special groups. The review process will avoid items with possible trademark misuse. Items that might preclude an "E" rating by ESRB guidelines will also be avoided.

# 1.3 Characters

## 1.3.1 Guests

There can be up to 30,000 guests in the game. Guests are generated outside of the park. For the purpose of this document, they are referred to as guests even if they are not inside the park. Guests have some innate characteristics that are determined when the guests are first generated. In addition to those characteristics, there are several statistics associated with each guest. Statistics change based on the guest's experiences. Guests have some possessions which they may exchange with other guests. Guests will wander around the park going on rides, eating, shopping etc. The guest AI system determines their behavior.

### 1.3.1.1 Data

#### 1.3.1.1.1 Characteristics

##### *1.3.1.1.1.1 Ride Preference (Spin, Speed, Height, Entertainment, interactive)*

Each guest has five ride preference parameters. Each parameter is a value between 0 and 10. Guests are generated with random values for these parameters. The sum of these values is limited between 15 and 35 for each guest. The value generation distribution can be adjusted by a global setting.

##### *1.3.1.1.1.2 Ride Tolerance (Spin, Speed, Height)*

Guests have a tolerance for certain types of ride experiences. This is independent of their preference. Their tolerance to spinning, fast and high rides is a value between 0 and 10 for each category. These numbers are distributed randomly.

##### *1.3.1.1.1.3 Scenery threshold*

While walking on paths, guests view scenery. The number of scenery objects viewed per minute will determine if the guest is impressed with the scenery. The Scenery Threshold is the number of scenery items per minute the guest needs to see in order to have a favorable response.

\*\* As soon as the park has more than two non-generic scenery themes, guests may be spawned that dislike a certain theme. This theme will not be the most prominent of the park, all others can be disliked at 1% probability. Disliked scenery will decrease happiness. Rides themed with the disliked theme will be ridden only if they match the preference more closely and will make happier less (50%).

##### *1.3.1.1.1.4 Clothing*

Guests are generated with shoes, upper and lower garments selected from a list of available items. Shoes may be sneakers, sandals, dress or boots. Upper garments are either short sleeve or long sleeve shirts. In cold climates, guests may wear coats. Lower garments are shorts or pants. For female guests, lower garments may also be short or long skirts. A variety of colors are available for each item.

#### **1.3.1.1.1.5 Name**

Each guest will have a first and last name. Family groups will have the same last name. Members of a group will not have the same name.

#### **1.3.1.1.1.6 Physical**

A guest's physical characteristics include age (child, teen or adult), gender, physique (skinny, average, fat, obese) and hair. The default production ratio of physique types is 30% skinny, 30% average, 30% fat and 10% obese. These ratios can be changed by a global setting. The age production distribution will depend on the group setting. See below for discussion of group ratios. If groups are not used, the default production ratio for ages is 25% children, 50% teens and 25% adults. These ratios can also be changed by a global setting.

Hair styles for male children are short (50%) or medium (50%). Hair styles for female children are medium (35%), long (35%) or ponytail (30%). Hair styles for teen males are short (30%), mohawk (5%), spiked (20%) or medium (45%). Hairstyles for teen females are medium (25%), long (25%), ponytail (25%), perm (20%) or spiked (5%). Hairstyles for adult males are short (35%), medium (30%), bushy (25%) and bald (10%). Hairstyles for adult females are medium (30%), long (35%) and bushy (35%). Non-spiked hair color can be black, brown, blonde or red. Spiked hair color can be green, red, blue, yellow, orange or white.

Racial differences are implemented as different skin colors. The options are "pink", "black", "brown" and "yellow". This is a purely visual distinction. No characteristics, statistics, behavior or gestures are associated with the racial feature.

#### **1.3.1.1.1.7 Group**

Depending on a global setting, guests may be generated as belonging to a group or as independents. Group types are pair (30%) [Pairs are either teen or adult pairs of opposite gender.](#), friends (40%) and family (30%). Pairs are either teen or adult pairs of opposite gender. Friends are two (10% - children only), three (25%), four (40%), five (15%) or six (10%) guests of the same age group. These percentages can be modified by a global setting. Families consist of two adults (two genders) and one (20%) two (40%), three (25%) or four (15%) children.

If groups are allowed, independent teen and adult guests may find a compatible guest of the opposite gender and form a new pair group. Otherwise, the guest's group association will not change. To form a new pair group, both guests must have similar ride

preferences (within 10% of each other on all categories) and must have a happiness of at least 90%. A new pair group will enter a trial period and if both guests' happiness remains above 90% for 20 minutes, the pair group will become permanent. If the happiness rating is not maintained for that time period, the pair group will dissolve and the pair will never attempt to group again.

#### ***1.3.1.1.1.8 Special***

A special guest will use a custom texture for the face. These can also use a unique 3d model.

### **1.3.1.1.2 Statistics**

#### ***1.3.1.1.2.1 Happiness***

Happiness ranges from 0 to 200 units. Waiting in line decreases happiness by 1 unit per minute. Watching an entertainer increases happiness by 1 unit per minute. Going on a ride with a good preference match will increase happiness by up to 10 units (2 per characteristic). A good match occurs if the ride's characteristic is within 20% of a guest's preference. Vomiting decreases happiness by 5 units. If hunger is 100%, then happiness will decrease at 1 unit per minute. If thirst is 100% then happiness will decrease at 1 unit per minute. If bladder fullness is 100%, then happiness will decrease at 2 units per minute. If the guest encounters more scenery objects per minute than their threshold, then happiness will increase by 1 unit per minute.

A mascot within two tiles will increase happiness by 1 unit per minute (adjusted by the mascot's efficiency rating). An entertainer's effectiveness modifies the happiness figure.

If happiness is below 10%, guests will decide to leave the park and will not go on non-transport rides. If happiness returns above 50% they will decide to stay in the park. If Happiness is below 5%, guests will become vandals. See "wetness" for further modifiers to happiness. When a guest leaves the park, the happiness value remains fixed (to influence new guests).

#### ***1.3.1.1.2.2 Hunger***

Hunger ranges from 0 to 200 units. Hunger steadily increases with time at a rate of 1 units per minute for children, 1 units per minute for adults, and 2 units per minute for teens. Eating food reduces hunger. Food items provide a specific amount (units) of energy. When hunger is greater than 80% of maximum, guests place priority on acquiring food.

#### ***1.3.1.1.2.3 Thirst***

Guests develop thirst over time. Thirst ranges from 0 to 200 units. The rate of thirst increase depends on the temperature and the environment. The default rate is 2 units per minute. Arid environments add 1 unit per minute to the rate. Hot environments add 1 unit

per minute to the rate. Thirst is relieved with drinks. Drink items each provide a specific amount (units) of thirst reduction. When thirst is greater than 85% of maximum, guests place priority on acquiring drink. Some food items will increase thirst.

#### ***1.3.1.1.2.4 Bladder***

Bladder fullness ranges from 0 to 200 units. Bladder fullness will increase at a rate of 1 unit per minute. Drinking increases bladder fullness. 50% of a drink's thirst reduction units will become bladder fullness units. Bladder fullness is completely relieved by visiting a restroom. When bladder fullness is greater than 80% of maximum, guests place priority on visiting a restroom.

#### ***1.3.1.1.2.5 Nausea***

Nausea ranges from 0 to 100 units. Nausea is increased by spinning rides and by ride tolerance mismatch. A ride will add a specified amount of nausea units due to its spinning characteristic. If a ride's intensity characteristic is greater than a guest's tolerance, then 10 units of nausea will be added for each such characteristic. Nausea is decreased by 1 unit per minute while walking or standing (not on a ride) and is decreased by 3 units per minute while sitting (not on a ride). Above 50% of maximum, vomiting may occur. The probability of vomiting ranges from 0 at 50% maximum nausea to 1 at 100% maximum nausea. Vomiting will relieve 20 nausea units.

#### ***1.3.1.1.2.6 Energy***

Energy is related to hunger and activity. Energy ranges from 0 to 200 units. The maximum energy at a given time is modified by hunger. At minimum hunger, there is no reduction. At maximum hunger, the maximum energy is reduced to 50%. Standing and stand-up rides do not affect energy. Walking decreases energy at a rate of 1 units per minute. Running decreases energy at a rate of 3 units per minute. Resting (sitting on bench or sit-down ride) increases energy at a rate of 2 units per minute.

#### ***1.3.1.1.2.7 Wetness***

Wetness ranges from 0 to 100 units. Some rides will cause a specific amount of wetness ranging from 0 to 100%. If a guest has a poncho, they will wear it on water rides and the wetness effect will be reduced by 80%. Being in rain without an umbrella or poncho increases wetness by 3 units per minute. Wetness will decrease by 1 unit per minute in non-arid climates. Wetness will decrease by 3 units per minute in arid climates. Guests may (probability = 10% per minute) shake water off if wetness is above 60%. Shaking decreases wetness by 15 units. Being wet above 20% in cold climates will decrease happiness by 1 unit per minute (independent of humidity). Being wet above 30% in a warm climate will increase happiness by 1 unit per minute.

#### ***1.3.1.1.2.8 Location***

Guest location in the park is specified by X, Y and Z coordinates when they are not on rides. If they are on a ride, their location is just referred to as being on that ride. Guests may be exposed, underground or under cover. Guests are classified as either approaching-park, in-park or leaving-park. If a guest approaches the entry gate and decides not to enter, he changes to leaving-park.

#### ***1.3.1.1.2.9 Activity***

A guest may be walking, running, standing, sitting or riding. Rides are either stand-up or sit-down. If not riding, guests may be eating, drinking, talking, or waiting. Guests may take photos. Guests may be heading for a particular ride or a general destination such as food, drink, restroom or any ride.

#### ***1.3.1.1.2.10 History***

A record will be kept of how much a guest spends, how many times they went on rides, which ride best met their preferences, number of times they vomited. Expenditures will be broken down by food, drink, rides and souvenirs. The total time they have spent in the park is also monitored.

### **1.3.1.1.3 Possessions**

Guests may carry some possessions. These may be purchased or received as gifts. Possessions can be given to other guests in group. Possessions (other than cash) may be accidentally dropped (1% probability per minute for each item). Dropped items are not picked up by others and simply become trash.

#### ***1.3.1.1.3.1 Souvenirs***

Souvenirs include clothing (hats and shirts), glasses, balloons, dolls and umbrellas and ponchos. Standard hats are cowboy, cap, visor or fur. Custom theme hats may be available. A guest can wear one hat at a time, but may carry a hat. A guest can wear only one shirt at a time. A guest can wear only one glasses at a time. Carried hats, shirts and glasses will be given away. Standard balloons are round. Custom theme balloons may be available. Balloons and t-shirts can be a single color or the shop can sell multiple colors. Glasses can be sunglasses, springy eyeball glasses or “Groucho” glasses. Stuffed animal dolls include teddy bears, panda bears, dogs, dinosaurs and mice. A guest can carry a maximum of three dolls and umbrella and poncho.

#### ***1.3.1.1.3.2 Map***

A guest may carry a map of the park. If they have a map, they will find their way around the park easier. If a guest receives a second map as a gift, they will carry it until they can give it away.

#### ***1.3.1.1.3.3 Cash***

Guests carry money. They are generated with a certain amount of cash. If a guest is happy and is low on cash, he may use an ATM machine if one is available. Cash is never lost or given away. Guests may receive cash as a gift from midway games.

#### **1.3.1.1.3.4 Ticket**

Guests may receive tickets for particular rides as gifts from midway games or as part of advertising campaigns before they enter the park.

#### **1.3.1.1.3.5 Consumables**

Guests may carry up to three consumable items. After consumption, there will be a trash item. Guests will put trash in trash cans or just drop it. The probability of dropping trash is 3% per minute. When they drop trash, they drop all trash items at the same time.

## **1.3.1.2 Behavior (AI)**

Guest behavior consists of making decisions and executing them. Some decisions are determined by the guest characteristics and statistics as described above.

### **1.3.1.2.1 Park Entry**

Upon generation a guest will head toward the park entry. As they approach the park, they may encounter guests leaving the park. The average happiness of leaving guests encountered by a new guest will be recorded. An average happiness greater than 70% will have a positive influence on the decision to enter the park. An average happiness below 50% will have a negative influence. An average happiness below 20% will have a strong (double) negative influence. The existence of advertising will have a positive influence. The positive effect from advertising is cumulative. If the total number of influences is positive, the guest will decide to enter the park. If the total number of influences is zero, there is a 50% probability of deciding to enter the park. If the number of influences is negative, there is a 25% probability of deciding to enter the park. This is a preliminary decision.

The final decision to enter the park is based upon the admission price and the park's entertainment value. The entertainment value of a park is determined by the quality and quantity of attractions (rides and shows). Each ride or show is rated by the sum of its five qualities (spin, speed, height, entertainment, interactive). The average rating for all rides and shows determines the quality of attractions. For parks that do not charge for rides, the quality of rides is divided by 15 and then multiplied by the total number of attractions; the result is multiplied by 2 to determine the optimum ticket price in US dollars. For parks that charge for individual rides *and* gate admission, the quality of rides is divided by 15; the result is multiplied by the number of rides and then divided by 2 to determine the optimum ticket price. If the park ticket price is less than 110% of the optimum price, the guest will decide to enter the park. If the ticket price is more than that, the probability of the guest deciding to enter the park is decreased by 10% for each 10%

that the price is above 110%. (example: if the ticket price is 120% of the optimum price, there is a 90% chance that the guest will enter; if the ticket price is 200% of the optimum price, there is only a 10% chance of a guest entering.)

If the gate price exceeds the ability to pay, the guest cannot enter. For a group, the entire group will enter or not enter. If necessary, cash can be taken unequally from members of a group in order to meet the total entry fee. If the entire group does not collectively have enough money, the entire group will not enter.

## **1.3.1.2.2 Destinations**

### ***1.3.1.2.2.1 Personal Need (Food, drink, restroom)***

If a guest develops a strong personal need (hunger > 80%, thirst > 85% or bladder fullness > 80%) then every member of the group will pursue the most pressing need. If a guest is waiting in line when a personal need threshold is reached, they will stay in line. Personal need will take precedence over other desires, including leaving the park. Guests with personal need will proceed to a nearby facility if they are waiting for group members to exit from an attraction. If there is no nearby facility, they will wait for group members to exit attractions and rejoin the group; then the entire group will proceed to the nearest appropriate facility.

### ***1.3.1.2.2.2 Attractions***

When a guest encounters a path section with an adjoining attraction entrance, they will always consider visiting the attraction. When any members of a group consider an attraction, all members of the group will also evaluate all attractions being considered. The group may split up with some of them going on different rides while others continue to wander around the area. If a guest is considering more than one attraction (either due to being in a group or because two rides have entrances on the same path section), they will prefer the ride with the best match to their preferences. For each category, the absolute difference between the ride's characteristics and the guest's preferences are summed. If the sum is more than 35 then the attraction is a bad match, and they will not go on it. If the sum is less than 20 then they will decide to go on it. If the sum is 20 to 35, then the probability (%) of deciding to go on it ranges linearly from 100% for a sum of 20 to 0% for a sum of 35. An exception occurs if a guest has a ticket for a free ride – they will go on it regardless of the preference match.

The initial decision to go on an attraction is subject to a ticket price evaluation if there is a charge. If the guest cannot afford it, they cannot go on it. If they have enough cash, they will evaluate the price based on the sum of ride ratings. A fair price is the sum divided by 4. If the ticket price is at or below the fair price, the guest will buy the ticket. If the ticket price is above the fair price, the probability of buying the ticket drops to 0 as the ticket price becomes 2 times the fair price.

If there is no queue or if the queue is full, the guest will be less likely to decide to stand in line for (enter) the ride. If it is raining, there is a 20% decrease in probability of standing in the (uncovered) line, otherwise, there is a 10% decrease.

If a guest decides against an attraction and there are other attractions to consider, they will next consider the best preference match of those rides not yet evaluated.

If one or members of a group go on a ride, members who are not going on a ride will stay within 7 “tiles” of the entrance of one of the rides being attended by a group member. These wandering members are free to choose to go on a ride while others are on a ride. When a guest exits a ride, they will head toward the center of the group member locations. They can then begin to wander and perhaps go on more rides. If, upon exiting a ride, a guest cannot tell how to get back to the group, they will head for the ride entrance.

#### ***1.3.1.2.2.3 Wander***

If guests do not have a specific destination, they will simply wander. All members of a group with no destination will go in the same direction. When they encounter a section of path where there is a choice of direction, they will either make a random choice if they have no map, or they may (probability = 15%) pick a destination (attraction) from a map. Closer attractions are given preference. Attractions are evaluated in order of closeness (by path distance) and considered with a probability of 25% until one is selected. As soon as one member of a group has made a new destination selection, all members of the group will assume the same destination. Large maps placed by a path act as a direction choice section.

#### ***1.3.1.2.2.4 Exit***

A guest will decide to leave the park if their happiness is below 10%. If one member of a group decides to leave, the entire group will decide to leave. If an unhappy leaving guest has an increase of happiness, they will decide to stay. In a leaving group, the decision to stay will only occur if every member of the group is sufficiently happy; in such a case, every member will decide to stay.

#### ***1.3.1.2.2.5 Path (route) finding***

When a guest is headed for a particular destination, they will go along a path in the same direction until they encounter a section of path where there is a choice of direction. At that time, they will decide upon the best direction in order to get to their destination.

If a guest has decided to stand in line for an attraction, or if their target uses only lines (such as restrooms or stalls) then they will seek the end of the line and then enter into the line. The line will naturally follow a straight path as much as possible.

### **1.3.1.2.3 Rides**

Interactive rides require some guest decisions. These will be determined on a purely random basis.

### **1.3.1.2.4 Shops**

#### ***1.3.1.2.4.1 Food, Drink, Restroom, Souvenir, ATM, First Aid***

When guests encounter a path section with an adjoining shop, they will always consider visiting the shop. If a guest is already carrying a food item, they will not visit a shop for food. If a guest is already carrying a drink item they will not visit a shop for drinks. If a guest has hunger above 50%, they will visit a shop offering food. At a hunger of 50%, guests will pay 1 dollar for 10 units of food. At a hunger of 100%, they will pay 4 dollars for 10 units of food. If a guest has thirst above 50%, they will visit a shop offering drinks. At thirst of 50%, they will pay 1 dollar for 10 units of drink. At a thirst of 100%, they will pay 3 dollars for a unit of drink. The Vendor's efficiency will affect the dollar amounts with an additional scaling factor of 0.5. (A vendor efficiency of 1.8 will increase the dollar amounts by a factor of 1.4)

Guests will visit a free restroom if their bladder fullness is over 30%. Guests will not pay for a restroom unless bladder fullness is at least 80%. They will pay up to 1 dollar at a bladder fullness of 100%.

Guests may pay for nausea relief at a first aid station. They will not pay unless their nausea is at least 50%. At a nausea of 100%, they will pay up to 5 dollars.

Guests may buy a souvenir if their happiness is greater than 70%. They will pay up to 10 dollars when their happiness is 100%. They will buy as many souvenirs as they can carry, but only one per 5 minute period.

If guests have a happiness above 70% and cash below 30 dollars, they will use an ATM machine. They will withdraw from 20 dollars up to 40 dollars at a happiness of 100%. Guests will withdraw twice as much if a security guard is within 5 tiles of the ATM. Only adult and teen guests can use an ATM.

### **1.3.1.2.5 Group Giving**

Members of a group may share items when they are in close proximity. If a group member is low on cash (less than 20 dollars), other members of the group will give them cash. If the group as a whole has less than 20 dollars each, they will attempt to equalize their cash as much as possible. If a group member has more than one doll, they will share with group members who have fewer. Guests do not share food or drink.

### **1.3.1.2.6 Vandalism**

A guest whose happiness is below 5% will be a vandal. If they encounter an item which can be vandalized and there is no security guard within 6 tiles, they will vandalize it.

Trash cans, drinking fountains and lamps are subject to vandalism. Upon vandalizing an object, a guest's happiness will increase by 3 units.

## **1.3.1.3 Actions**

### **1.3.1.3.1 Locomotion**

Guests can stand, walk slow, walk normal or run. They may jump in place. They will usually look forward while walking and occasionally turn to look to either side. If there are theme objects to the side, they will look longer.

### **1.3.1.3.2 Personal**

Guests raise food or drink to mouth while eating/drinking. Guests can eat/drink while in a queue line. They hold their stomach when very nauseated. They will stop walking and bend forward when they vomit. Afterwards, they wipe their mouths and then resume their previous action. Guests will occasionally cough or sneeze.

### **1.3.1.3.3 Ride specific**

Some guests will raise their hands when they are on a sit-down ride which is dropping, while other guests will scream. Guests may clap after a show.

### **1.3.1.3.4 Interactions**

When giving each other items, guests will reach out with the gift object in their hand. The receiving guest will reach out and take the object. They both then drop their arms and resume normal actions. Adults will bend down to give objects to children.

### **1.3.1.3.5 Reactive**

Guests will stand and shake off water when they are very wet. They will jump a little when they are splashed with water. While standing in line, they will look at a monitor if available. If not, they will occasionally look at their watches.

## **1.3.2 Employees**

Employees consist of Janitors, Mechanics, Security Guards, Mascots, Vendors and Entertainers. Janitors clean the park. Mechanics repair rides. Security Guards prevent vandalism and increase ATM use. Vendors sell items in shops. Mascots perform on paths while Entertainers (magicians, circus performers, singers) perform in shows.

## **1.3.2.1 Data**

### **1.3.2.1.1 Characteristics**

#### ***1.3.2.1.1.1 Clothing***

Janitors wear black work shoes, pants and a cap. In cool climates, they will wear long sleeve shirts and in warm climates they will wear short sleeve shirts.

Mechanics wear black work shoes, a cap and coveralls.

Security Guards wear black work shoes, pants and a police cap. In cool climates, they will wear long sleeve shirts and in warm climates they will wear short sleeve shirts.

Mascots wear costumes to make them look like funny animals or other fictional characters. There will be costumes for a lion, tiger, bear, dog, monkey and elephant.

Vendors wear white sneakers, white pants and white cap. In cool climates, they will wear white long sleeve shirts and in warm climates they will wear white short sleeve shirts.

Magicians wear a tuxedo and a top hat. Circus performers wear brown pants and short sleeve shirt. Singers wear spandex outfits with high contrast colors.

#### ***1.3.2.1.1.2 Accessories***

Janitors carry a broom. Mechanics carry a tool box. Security Guards carry a club. Circus performers carry a whip. Singers carry guitars or microphones. Other employees do not have accessories.

#### ***1.3.2.1.1.3 Name***

Most employees have a first and last name. Magicians have a stage name consisting of an adjective followed by a first name. Adjectives are chosen from the list: Amazing, Fantastic, Fabulous, Great, Incredible, Magnificent, Sensational, Super, Stupendous, Terrific and Wonderful.

#### ***1.3.2.1.1.4 Physical***

Employees are all adults. Physique is randomly chosen. Most employees are 33 $\frac{1}{3}$ % each of slender, average and fat. Security Guards are 25% slender, 25% average and 50% fat. Singers are 60% slender, 30% average and 10% fat. Hair style is short for all but singers who have long hair. Hair color and racial style are equally randomly chosen.

#### ***1.3.2.1.1.5 Capability***

Each employee has an innate capability rating. This rating ranges from 0.5 to 2.0 where the normal (average) is 1.0. See efficiency below for more details on the effect of

capability. The player cannot see the capability rating until an employee has been working for two months. Note: a magician with the name of “Amazing Earl” will always have a special capability rating of 3.0.

#### ***1.3.2.1.1.6 Assignment***

### **1.3.2.1.2 Statistics**

#### ***1.3.2.1.2.1 Location***

Vendors and Entertainers are confined to their assigned shop or show. Vendors stay in one spot. Entertainer location is specified by X, Y and Z coordinates referenced to an anchor point in the show structure. Other employees have a location specified by X, Y and Z coordinates.

#### ***1.3.2.1.2.2 Tether***

An employee may be tethered to a point. This will restrict their movements. Vendors and Entertainers are inherently restricted. If tethered, there is a maximum distance from the tether point that an employee can travel. The distance varies from one tile to thirty tiles. These items are specified by the player.

#### ***1.3.2.1.2.3 Activity***

Employees may stand, walk or perform task. Janitors, mechanics and mascots do not stand. Security Guards stand if they are tethered. The amount of time they stand is a percentage determined by the inverse of the tether distance in tile units. Hence a tether of 1 tile results in a guard who stands in one place at all times. Vendors always stand in place.

#### ***1.3.2.1.2.4 Salary***

For each employee type, there is a standard salary. Employees who are more capable will perform better. More capable employees deserve higher salaries and will perform even better if paid according to their capabilities. Less capable employees perform less well. Higher salaries can motivate them to improve somewhat. When initially hired, employees start with the standard salary. Each employee’s salary may be changed by the player.

Employee	Standard Salary (Monthly)
Janitor	1800
Mechanic	2400
Security Guard	2400

Vendor	1800
Mascot	1800
Magician, Circus Performer	2400
Singer	4000

#### **1.3.2.1.2.5 Efficiency**

Efficiency is determined by capability times relative salary. Efficiency cannot be higher than 2.5 (except for “Amazing Earl” who can have an efficiency of 5). For games with no financial model, the salary is taken as 1.0 for the efficiency calculation.

Janitors, mechanics and security guards walk faster if they have a higher rating. Mechanics also carry out repairs faster if they have higher ratings. Mascots impart more happiness if they have a higher rating. Vendors have higher sales depending on their rating. Entertainers will deliver more happiness with higher ratings. Efficiency is not revealed to the player until two months after employment.

#### **1.3.2.1.2.6 History**

Monthly counts of employee’s actions are tallied.

Employee	
Janitor	Trash picked up, Trash cans emptied, Vomit cleaned up, gardens watered
Mechanic	Rides repaired, rides inspected, vandalism repaired
Security Guard	ATM use encouraged, doughnuts eaten (random number 30-100)
Vendor	Items sold
Mascot	Guests entertained
Entertainer	Guests entertained, for magician: cards up sleeve (random number 1-6)

## **1.3.2.2 Behavior (AI)**

Employees have limited behavior patterns. They do not interact with guests or with one another.

### **1.3.2.2.1 Destinations**

Janitors, Mechanics, Security Guards and Mascots will wander around in the park until a specific task is triggered for them. Vendors stay in their shops. Entertainers follow a player specified action sequence.

The wandering employees will walk in a particular direction until they encounter a trigger, tether limit or until they encounter a path intersection. When they encounter a path intersection, they will head in a random direction, which can include the direction they just came from – but at a 50% reduced probability. For example, a stall beside a straight path represents a path intersection. Since there is no sense in walking to the shop, the employee's options are to continue walking straight or turn around. Instead of a 50-50 probability, the direction they just came from will be reduced to 25% probability and continuing will be 75% probability. At a true three way intersection, the probabilities will be adjusted from 1/3 each to 16% for the originating direction and 42% for each of the two other directions.

When a wandering employee encounters a tether distance limit, they will turn around.

When a Mechanic receives a call to work on a particular ride, he will head toward that ride just like a guest would.

### **1.3.2.2.2 Task Triggers**

#### ***1.3.2.2.2.1 Janitor***

Presence of trash or vomit within a tile will trigger a janitor to move to it and sweep it up. He will move toward the nearest item. Once cleaned, if there are other items on that tile, he will move to the nearest remaining item. When all items on a tile are cleaned up, adjacent tiles will be scanned for trash or vomit. If trash or vomit is present, the janitor will move toward it. If more than one adjacent tile contains trash or vomit, the janitor will move to whichever tile he is closest to. If two janitors head for the same item of trash or vomit, the first one there will be the one to clean it up. The other janitor will look for other items to clean. Once all items on the current and adjacent tiles have been cleaned, the janitor will begin wandering in a random direction.

A janitor will empty a full (or nearly full) trashcan. He will walk to it, carry out the empty can action and then resume wandering.

#### ***1.3.2.2.2.2 Mechanic***

When a mechanic is near a ride, he will consider inspecting it. The probability of carrying out an inspection is inversely proportional to the ride's reliability. An inspection will automatically provide twenty minutes of guaranteed operation for a ride, regardless of reliability. If a ride is broken down, the mechanic will carry out a repair. A mechanic may be "called" if a ride has been broken down for five minutes without repair. The nearest available mechanic (considering tether limits) will be called first. If there is no response in ten minutes, all available mechanics will be called. The first one to arrive will cancel

the call for all other mechanics headed to the ride. Upon a canceled call, a mechanic will resume wandering in the park.

If a mechanic is on a tile with a vandalized item, and is not answering a call, he will repair the vandalized item. After the repair, he will resume wandering.

#### ***1.3.2.2.3 Security Guard***

If a security guard passes by a doughnut shop, they will walk up to it. They then resume wandering.

#### ***1.3.2.2.4 Mascot***

When a mascot is on a tile with more than 6 guests, they will begin a routine. The routine will be selected at random. After the routine, the mascot will wander at least one tile.

### **1.3.2.3 Actions**

#### **1.3.2.3.1 Locomotion**

The speed at which employees walk depends on their efficiency rating. Employees do not stand or sit.

#### **1.3.2.3.2 Task Specific**

##### ***1.3.2.3.2.1 Janitor***

Empty full (at least 80% full) trashcan. Sweep up trash on walkway. Sweep up vomit on walkway.

##### ***1.3.2.3.2.2 Mechanic***

Inspect rides. Repair rides. Repair vandalized items.

##### ***1.3.2.3.2.3 Vendor***

When a guest buys something, a vendor will take money from the guest, place the money into a register, take an item off the shelf and then hand the item to the guest.

##### ***1.3.2.3.2.4 Mascot***

Mascots will perform some entertainment routines. These routines include waving, short jumps, high jump, spinning, juggling, stand on head and somersault.

##### ***1.3.2.3.2.5 Entertainers***

Magicians follow a sequence of tasks. Possible tasks are levitation, saw in half, rabbit in hat and doves.

Musicians follow a sequence of tasks. Possible tasks are play instrument, walk, shake head, jump high, swing arms, hop forward, shake fist, drop to knees and spin. Other tasks are walk onto stage at beginning of sequence and walk off stage at end of sequence.

## 1.3.3 Animals

The only planned animals at present are ducks. Ducks will be generated if there are ponds (at least a 3 by 3 area of full tiles of water) in the park. One duck can be generated for every 12 tiles of water. Ducks will fly into a park in spring and fly out in fall. They will land on the water

### 1.3.3.1 Data

#### 1.3.3.1.1 Location

The animal's location is specified by X, Y and Z coordinates.

#### 1.3.3.1.2 Activity

A duck's activities can be flying in a specified direction or sitting in water. A duck can quack.

### 1.3.3.2 Behavior

When a duck flies over a pond area, there is a 25% chance that they will decide to land on that pond. For large ponds, the decision is made again every 10 tiles. If a duck crosses the entire park area, they will continue to fly out of bounds and will not return.

If there are more than 6 ducks in a single tile of water, there is a 5% chance that a duck will decide to take off. They will take off in a random direction.

In Fall, ducks begin to leave with a 5% probability per day. At the end of fall, any remaining ducks will leave.

### 1.3.3.3 Actions

Flying: ducks fly in a straight line at a constant altitude.

Landing: a duck will spiral down and land on the surface of the water tile.

Taking Off: a duck will take off in a particular direction and rise in altitude to a given height. Then they will be in Flying mode.

Diving: ducks sitting on water will occasionally dip their heads into the water for a couple of seconds, then return to sitting position.

## **1.4 World Activities**

### **1.4.1 Rides**

#### **1.4.1.1 Data**

##### **1.4.1.1.1 Reliability**

###### ***1.4.1.1.1.1 Inherent reliability***

A ride will have an inherent reliability related to its mechanical stresses and complexity. A ride with high G-forces and speeds will have a lower inherent reliability. A ride with a large number of moving components will have a lower reliability, even though it has low G-forces and speeds. Tracked rides have moving components in the form of lift chains, brakes and boosters. Inherent reliability is calculated based on test results. The calculated value will range from 25% to 100%.

###### ***1.4.1.1.1.2 Age***

A ride's age is determined from the time it was first placed in service. If a ride is moved within the park, its age does not change. Age does not affect reliability but is used for popularity considerations.

###### ***1.4.1.1.1.3 Time since last inspection***

The probability of a breakdown depends on current reliability and time since last inspection.

###### ***1.4.1.1.1.4 Current reliability***

###### ***1.4.1.1.1.5 Last Breakdown***

###### ***1.4.1.1.1.6 Down Time***

###### ***1.4.1.1.1.7 Inspection frequency***

## **1.4.1.1.2 Aesthetics**

*1.4.1.1.2.1 Name*

*1.4.1.1.2.2 Music*

*1.4.1.1.2.3 Colors*

*1.4.1.1.2.4 Theme*

*1.4.1.1.2.5 Entry style*

*1.4.1.1.2.6 Exit style*

*1.4.1.1.2.7 Fence style*

## **1.4.1.1.3 Financial**

*1.4.1.1.3.1 Construction Cost*

*1.4.1.1.3.2 Maintenance Cost*

*1.4.1.1.3.3 Ticket Price*

*1.4.1.1.3.4 Running Cost*

*1.4.1.1.3.5 Daily Income*

*1.4.1.1.3.6 Total Income*

*1.4.1.1.3.7 Customers per day*

*1.4.1.1.3.8 Number of customers*

## **1.4.1.1.4 Guest Opinion**

*1.4.1.1.4.1 Queue Time*

*1.4.1.1.4.2 Popularity*

*1.4.1.1.4.3 Satisfaction*

## **1.4.1.1.5 Test Results**

*1.4.1.1.5.1 G forces, speed, air time, loops, spins*

*1.4.1.1.5.2 Spin, Speed, Height, Entertainment, interactive*

## **1.4.1.1.6 Operation**

*1.4.1.1.6.1 Departure Condition*

1.4.1.1.6.1.1 Time, Capacity

*1.4.1.1.6.2 Vehicle*

*1.4.1.1.6.3 Number of circuits*

*1.4.1.1.6.4 Cars per Train*

*1.4.1.1.6.5 Number of Trains*

*1.4.1.1.6.6 Lift chain speed*

*1.4.1.1.6.7 Synchronize with adjacent stations*

*1.4.1.1.6.8 Block section*

*1.4.1.1.6.9 Operating mode*

*1.4.1.1.6.10 Leave if another train arrives*

## **1.4.1.2 Flat Rides**

### **1.4.1.3 Tracked Rides**

#### **1.4.1.3.1 Tracks**

*1.4.1.3.1.1 Style*

1.4.1.3.1.1.1 Trough

1.4.1.3.1.1.1.1 Flat

1.4.1.3.1.1.1.2 Curved

1.4.1.3.1.1.2 Center Guide

#### **1.4.1.3.2 Wheels**

#### *1.4.1.3.2.1 Running*

#### *1.4.1.3.2.2 Upstop*

#### *1.4.1.3.2.3 Friction*

### **1.4.1.3.3 Vehicles**

Vehicles are either ballistic or powered. Ballistic vehicles will coast due to momentum and accelerate according to gravity. Accelerators and brakes can be used to affect vehicle speed. Vehicles can be recolored. Powered vehicles will be affected by slopes. They will obey signals on the tracks. Note: accelerators, brakes, vehicle power and signals may malfunction.

#### *1.4.1.3.3.1 Data*

Vehicle type, Skin, Location, direction, speed, mass, rolling resistance, wind resistance, wheel type, ID, preceding, succeeding, power, top speed, minimum speed, braking deceleration, spin direction, spin speed,

#### *1.4.1.3.3.2 Physics*

##### 1.4.1.3.3.2.1 Ballistic

##### 1.4.1.3.3.2.2 Powered

#### *1.4.1.3.3.3 Train Configuration*

##### 1.4.1.3.3.3.1 Conventional

##### 1.4.1.3.3.3.2 Articulated

##### 1.4.1.3.3.3.3 Trailered

## **1.4.2 Animations**

#### \*\* 2.2.4.3.2 Triggered (Events)

Triggered scenery items are placed where desired and also need to be associated with a particular track [or path](#) segment of some ride [or area of the park](#). These items can be moved and rotated after they are placed. The trigger track [or people path](#) can be changed as desired. There are no other settings for these objects. They are typically chosen from theme groups. A speaker is a special type of item. It plays an audio recording rather than displaying an animation. The player can select the recording to be played. [The end of a ride event should also be able to trigger the release of a block break.](#) [Speakers can also be triggered for a single or multiple](#)

sound event by track ride or peep path movement. Speakers can also play from a sound list or a single sound from a list.

## 1.4.3 Environment

### 1.4.3.1 Weather

#### 1.4.3.1.1 Wind

#### 1.4.3.1.2 Temperature

#### 1.4.3.1.3 Precipitation

##### 1.4.3.1.3.1 Snow/Ice

Iceicles will appear and hang from the branches of deciduous trees in cold winter environments. Snow will appear on evergreen trees in cold winter environments.

### 1.4.3.2 Water

## 1.4.4 Time

Rain is more common in spring and less common in the summer.

1.4.4.2 Park Hours

At any time, the opening and closing hours of the park can be changed to any time.

The time the park is open can also be chosen from March to October or Year Round.

When the park opens, the guests fill the park to peak capacity in a few hours of game time. When the park closes, the guests rapidly leave the park.

1.4.4.3 Game Time

The game has three speeds ormal, Fast, and Super Fast.

Normal: 1 minute real time=2 minutes game time

Fast: 1 minute real time=5 minutes game time

Super Fast: 1 minute real time=12 hours game time

As time in the park passes so do the months and years

1 hour game time=1 month

### 1.4.4.1 Season

Deciduous trees will change colors in fall and loose their leaves in winter. Green leaves reappear in Spring.

\*\*Weather affects plants through the season. Certain trees that are leafed trees such as a Liquid Amber, Maple and Birch lose their leaves during the winter season, leaves grow back during the spring season. During the summertime the trees are full of leaves, during the fall, certain trees leaves change color before disappearing.

During the deep winter, trees in colder climates may develop ice on their branches. In extremely cold environments, trees such as Conifers and Fir trees such as Pines, gain snow on their branches, during the summer they drop cones on the ground if they have them.

Trees in warmer climates such as Palm Trees during high winds may lose their shucks, or if they are coconut palms may drop coconuts and other fruit.

**Added 04-30-2007 Appended to the trees.**

Trees planted - Multiple Tree Planting. User can plant multiple trees. Options include random area. Users can also specify the planting area with a few tools.

Acre - User specifies the size of the area by the acreage. 1 = 1 square acre area.

Lasso - User can lasso an area and then plant the multiple trees in that area.

Square Selection - User can select a boxed area and then plant the trees.

Each tool also has a density either by the number of trees to plant or a random amount.

Tree Type - Three options exist here. The first is the same type of tree. The second option is a random selection of trees. If you check the small climate box, the trees conducive to a specific climate where your park is located will be planted. The third option is a scrolling list of the trees or bushes. You can select all, select none or check mark which trees or bushes will be planted.

## **1.4.5 Finances**

## **1.4.6 Evaluation**

# **1.5 *Static Elements***

## **1.5.1 Consumables**

## **1.5.2 Souvenirs**

## **1.5.3 Scenery**

### **1.5.3.1 *Nature***

#### **1.5.3.1.1 Gardens**

##### ***1.5.3.1.1.1 Flower Arrangements***

Flower arrangements are created at first by placing 3 meter (one tile) or 1.5 meter (1/4 tile) flower beds on the grid. These flower beds initially contain white, densely planted flowers unless otherwise specified and can have an optional border on any edge not connected to another flower bed. There are borders that match each common theme. Once the desired area has been covered in flower beds, the design can be 'painted' on using a color palette and brush interface. Otherwise areas of the arrangement can be selected in 1/4 tile sections to be filled with certain colors.

##### ***1.5.3.1.1.2 Hedges, hedgerows and Topiary***

Hedges and hedgerows can be used to divide areas of gardens or separate paths. Both have similar appearances, but hedges cover areas whereas hedgerows only cover dividing lines such as path edges and tile boundaries. Hedges can be placed as single tiles or 1/4 tiles, hedgerows can be placed as single tile edges or 1/2 tile edges. Certain types of hedge are available in different combinations of natural (bushy), shaped (square), or as topiary, where the hedge is carved into a simple design such as a duck or a rocket.

## **1.5.3.2 Statues**

# **1.5.4 Other**

### **1.5.4.1.1 Path Enhancements**

Several items can be added to a walkway. Most of them are placed on the edge of the walkway.

**Lamps:** The player can select from a variety of lamps (single post, triple bulb, tall post with ring of bulbs or custom). The bulbs may be broken by vandals.

#### ***1.5.4.1.1.1 Benches***

A variety of benches are available. Guests will sit on benches to rest or eat. Benches can accommodate one or two guests. Bench textures are wood, cement, steel or custom.

#### ***1.5.4.1.1.2 Tables***

Guests will sit at tables to eat or rest. Tables can hold up to six guests. Tables are not added to the edge of a walkway – they are placed in the center of a “tile”. The player will typically place path pieces to the side of the main path and put tables in those areas. Tables can be round or rectangular. The texture can be cement, wood, marble, steel or custom.

#### ***1.5.4.1.1.3 Trash Cans***

Guest will place trash (food containers, empty cups) in trash cans. Guests may vomit into trash cans. Trash have a finite capacity. Janitors will empty trash cans. A full trash can will result in guests dropping trash around it. Trash on the ground (whether near a can or not) will have a negative impact on guests impression of the park. Trash cans are easily vandalized. Nearby security will decrease vandalism. Trash cans are round steel cans but they can be inside covers of cement, brick, marble, wood or custom.

#### ***1.5.4.1.1.4 Drinking Fountains***

A variety of drinking fountains are available (steel pedestal, cement pedestal, marble pedestal, steel chiller or custom). Guests will drink from these when they are thirsty. Guests prefer to obtain drinks from shops so they only drink from fountains when they are very thirsty. In hot environments, the presence of chilled fountains improves guests attitude toward the park. Fountains may be vandalized.

#### ***1.5.4.1.1.5 Map***

A large map can be placed beside a walkway to help guests find their way around the park. Maps encourage guests to go on big rides.

#### ***1.5.4.1.1.6 Signs***

No entry signs can be placed across a walkway. Employees can still pass through the signed path. Advertising signs can be placed beside or across a path. Rides can be promoted by these signs. The player can also load a custom graphic onto a sign but it will not affect the guests. Advertising signs can be small, medium or large and can be lighted as well as animated.

#### ***1.5.4.1.1.7 Public Address***

Speakers promote events and rides. The player can select rides to be promoted. Localization of speech content will be needed. The player can choose more than one language for announcements. Park closing will be automatically announced. The player can specify which events to have announced. When fireworks and shows are designed, the player can specify at that time that those items should be added to the announcement system.

#### ***1.5.4.1.1.8 Queue line monitors***

These can only be placed in queue lines. They increase guest's tolerance for waiting in line. Rides, shops, shows and food items can be advertised with the monitors. The player can specify a group of items to advertise via the monitors. Simple animations will play on the monitors. These will show prescribed coasters, water rides, fireworks, etc. There is no provision for custom animations.

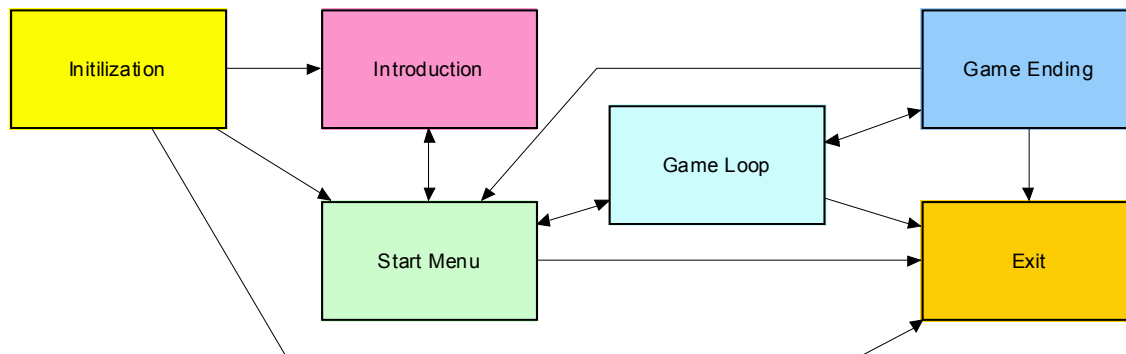
### **1.5.4.1.2 Vomit**

If a guest vomits onto the path, the vomitus will remain until it is removed by a janitor. Rain will not remove or alter it and neither will other guests walking on it. If a guest vomits into a trash can, there will be no effect except to increase the amount of trash in the can.

### **1.5.4.1.3 Trash**

# 2 User Interface

## 2.1 Flowchart



Execution begins in the Initialization block. All memory allocation, library activation, graphics initialization, internet access and default setting determination take place here. If there is any error, the user is notified and execution transfers to the Exit block. By original default, execution will transfer to the Introduction block. However, if the user has previously set a flag to skip the introduction, then execution will proceed directly to the Start Menu block.

The Introduction block will display a sequence of park images and construction to provide the user with appreciation for the capabilities of the game. The player can interrupt the sequence at any time. Upon completion or interruption of the sequence, execution transfers to the Start Menu block.

The Start Menu block allows the user to start a new park or load an existing park. This block also provides for connection to the internet to locate a multiplayer game to join or to locate custom content to download. It also allows for uploading custom content. The user has the option of returning to the introductory sequence. The user can also choose to quit the game from this point. The user may select to play a goal oriented scenario.

The Game Loop is the main block of the game. The user can return to the Start Menu or quit directly. If the user is playing a scenario with a specific end-criteria, execution will transfer to the Game Ending block when the criteria is met.

The Game Ending block will update any score card as indicated. The user will have the option of resuming the park with either no or new goals. The user can otherwise choose to end the game or return to the Start Menu Block.

The Exit block releases allocated memory and allows the program to terminate gracefully.

## 2.1.1 Introduction

The introduction sequence displays some park scenes. These will provide an overview of the capabilities of the game and provide some ideas for beginners. The scenes will be:

Overview of a large park.

View of the entrance with guests entering.

Carousel

Coaster cresting a lift hill and starting down big drop

A rotating flat ride (eg Scrambler or Tilt-a-whirl)

Shops

Log flume splashing

A sequence showing construction of part of a coaster

A sequence showing construction of a building

A Ferris Wheel

A sequence showing creation of a custom flat ride

Guests swimming

## 2.1.2 Start Menu

Functions which are unique to the Start Menu are:

1) Maintain resources: view a directory of the player's rides, buildings, parks, scenarios, scenery, theme groups and guests. Items can be deleted, renamed, or changed to a different theme group. Theme groups can be created.

2) Internet resources: connect to the internet at the official site or a site chosen by the player and look for new resources. The player can also submit their custom items for upload. Connecting to the official site will also allow for checking for updates to the program.

3) Initiate multiplayer games: connect to the internet to look for a game to join or invite others to join you.

4) Replay Demonstration.

5) Scenario Scores: view a list of scenarios available and scores.

Functions which are common to the Start Menu and the Game Loop are:

Settings: Graphics, Audio, Inputs, preferences

Game file operations: New Game, Save Game, Load Game, Resume Game, start Scenario.

Exit the game altogether.

## 2.1.3 Game Loop

The main menu of the game loop provides access to the Settings, Game File Operations and Exit just as they are in the Start Menu. Additional main menu items are:

Pause/Resume

## 2.1.4 Game Ending

The player is presented with a score and is shown previous scores on the scenario.

Upon completion of scenario goals, the player can choose to resume playing the park, end the park and return to the Start Menu, play another scenario or exit the game altogether.

## 2.1.5 Exit

*The screen navigation will be diagrammed as a flowchart. Pop up windows and menus need to be diagrammed also.*

## 2.2 Functional Requirements

*Every item in a flowchart needs a textual description of how it behaves. The user interaction and resultant action will be listed. Other details include describing the buttons, drag handles, size controls sounds and animations.*

## 2.3 Mockups

*Rough art mockups of the screens, windows and menus will be placed here. This will help to consolidate the “look and feel” of the user interface.*

## **2.4 GUI Objects**

*Animated buttons*

*Resizable windows*

*Drop down menus*

*Splash screens*

*Pop up menus*

*Cursors*

*List boxes*

*Text boxes*

# 3 Art and Video

## 3.1 Overall Goals

*The shape and proportions of objects within the game should be close to their real world counterparts. The color schemes should be brighter than real scenes however. This will emphasize the overall concept of the park being a “fun” place, rather than a dark and brooding environment. For the rides, a somewhat “cartoon” appearance with highly contrasting colors is preferred. Note that we do not want “cartoonish” in the sense of silly shapes or unrealistic proportions. Vegetation should appear like real vegetation. Trees should provide shade, not distract the player from the guests and rides. Scenery items will vary from unobtrusive shrubs to glittering animated contraptions. The more unobtrusive items should have subtle shading and colors while the more attention seeking items should be more like the rides with highly contrasting colors.*

## 3.2 2D Art & Animation

### 3.2.1 GUI:

Screens

Windows

Cursors

Arrow,

Pull (pliers)

Carry (cupped hand)

Pin (hammer and nail)

Activate Disaster (animated expanding red circles with a crosshair)

Icons

Buttons

Menus

## **3.2.2 Marketing and Packaging Art:**

Logo

Web page banner

Jewel case insert

Disc label

## **3.2.3 Terrain**

Grass

Sand

Gravel

Rock-smooth

Rock-rough

## **3.2.4 Environment**

Sky

Clouds

Moon

Earth (for parks located on the Moon)

Distant Volcano

Distant Trees

Distant water

## 3.2.5 Paths

Asphalt

Dirt

Tile

Brick

## 3.2.6 Special Effects

Fire

FireWorks

Explosions

## 3.3 3D Art & Animation

*3D objects involve models, textures and animations. The following list contains some of the items to be used. This section requires much more detail.*

Guests

Employees

Ride Tracks

Ride Vehicles

Ride Buildings

Shops

Scenery

Queue line monitor animations

Roller coaster loop

Roller coaster speeding through curves

Water ride splash

Fireworks

Rock band  
Queue line monitor still images  
Restaurant  
Souvenir shop  
Guests sitting in chairs at theatre

## **3.4 Cinematics**

### **3.4.1 Introduction**

As the game loads, a simple introduction animation is displayed. This should include some simple graphic elements from the game. An example is: a guest approaching a ticket booth and receiving a gold ticket; a thought balloon then forms and a sequence of rides are shown. That sequence can repeat if the load time is dragging on. A progress bar should also be displayed.

### **3.4.2 Content Search**

When a player accesses the internet to look for available items, a time delay will occur. During this time, an animation can be displayed. An example is: a guest puts a token into a telescope and looks into the eyepieces; then a sequence of isolated scenery and ride items are shown.

### 3.4.3 Scenario completion

Upon successful completion of a scenario, a simple animation should be displayed. Different animations can be used depending on the scenario goal. For example, a financial goal animation could show a character in a suit surrounded by bags of money, tossing coins in the air while laughing gleefully. This animation should be two to four seconds long, but the player should be able to replay it if they desire.

Upon failure to meet the requirements of a scenario, a brief animation should be displayed. For example, a financial failure could show a character in ragged clothes on a street corner holding a sign “Will design coasters for food” while a passing car splashes water on him. This animation should be a couple of seconds long.

### 3.4.4 News Event

A disaster or bad accident or award presentation should be accompanied by a brief animation (unless the player turns off this feature). The event can be shown on a television screen with a family sitting and watching. The channel will be RollerCoasterNewsNetwork (RCNN). This should be three to five seconds long.

## 3.5 *Video*

No video content is anticipated to be used in this game.

# 4 Sound and Music

## 4.1 Overall Goals

There will be background sounds which serve to immerse the player in the environment of a theme park. Background chatter of people as well as various sounds (such as balloon inflators, turnstiles, etc) will maintain the illusion. Active devices will emit sound effects when the player POV is near them. Weather sounds will be used at times. The computer's stereo speakers will be used to help the player recognize the position of different sound sources. There will also be looping music clips associated with most rides. Some special activities will incorporate a sequence of music (such as a rock show.)

The player will be allowed to import their own MP3, WAV or OGG files to be played within the game.

## 4.2 Sound FX

### 4.2.1 GUI

Button clicks

Window opening

Pause (car brakes)

### 4.2.2 Rides

Chain lift

Air brakes

Scraping (on rails)

Wheel rumble

Hydraulic lifts

Squeaks (need oil!)

Electric motor hum

Gasoline motor

Gasoline motor back fire

Steam train piston release

Steam train whistle

Car horn –antique, regular

Splash

Door closing

Turnstile

### **4.2.3 Special Effects:**

Canon

Pistol

Fire

Explosions

Beeps

Flapping wings

### **4.2.4 Shops**

Balloon inflater

Drink pouring

Drop package on counter

Cash register (old fashioned but familiar)

Paper wrinkling

Squirt (e.g. mustard/mayo/ketchup)

Ice falling into cup

Trash can lid

Silverware clinking

## **Voices** (need to be multilingual)

Countdown (for rocket)

Chatter (“look at that”, “I wanna go on that”, “wow”, “how much”, etc)

“Ladies and Gentlemen...”

“Emergency”

“Please exit the park”

## **4.2.5 Environment**

Birds

Crickets

Water flowing

Waterfall

Balloon pop

Laughter

Crying

footsteps

## **4.2.6 Weather**

Wind – soft

Wind – strong

Rain – gentle

Rain – hard

Earthquake

Lightning strike

Thunder

## 4.3 *Music*

The user will be able to import custom music. Some default music will be provided. The default music should be instrumentals only.

Ride Music

Cinematic sequences

Introduction (? carousel)

Content Search (?"flight of the bumble bee")

Scenario Success (?"hallelujah" )

Scenario Failure (?"pop goes the weasel")

Award (trumpets)

Bad News (Funeral dirge)

### \* 4.4 Ride narration

The game will include a built-in ride narration recorder, and only requires a microphone. The player selects the ride they want to record a narration for, then selections the record button. All other action in the game is paused. The player goes into RideCam view, and a record-pause-stop dashboard appears in the bottom left corner. The player then continues to record the narration for the ride, and pauses/stops when necessary. The narration can be layered over one repeating track of music, or with multiple sections of music depending on the section of the ride.