

Town Defense Game Design Document

# Town Defense



By Gary Fishell

***-Save the town!***

## Table of Contents and Team Member Listing

### Table of Contents

- 1 Game Overview
- 2 High Concept
- 3 Unique Selling Points
- 4 Platform Minimum Requirements
- 5 Competitors / Similar Titles
- 6 Synopsis
- 7 Game Objectives
- 8 Game Rules
- 9 Game Structure
- 10 Game Play
  - 10.1 Game Controls
  - 10.2 Game Camera
    - 10.2.1 HUD
    - 10.2.2 Maps
- 11 Players
  - 11.1 Characters
  - 11.2 Metrics
  - 11.3 States
  - 11.4 Weapons
- 12 Player Line-up
- 13 NPC
  - 13.1 Enemies
    - 13.1.1 Enemy States
    - 13.1.2 Enemy Spawn Points
  - 13.2 Allies / Companions
    - 13.2.1 Ally States
    - 13.2.2 Ally Spawn Points
- 14 Art
  - 14.1 Setting
  - 14.2 Level Design
  - 14.3 Audio
- 15 Procedurally Generated Content
  - 15.1 Environment
  - 15.2 Levels
  - 15.3 Artificial Intelligence NPC
  - 15.4 Visual Arts
  - 15.5 Audio
  - 15.6 Minimum Viable Product (MPV)
- 16 Wish List

### Game Development Team Members

#### PRODUCER

Gary Fishell

#### PRODUCTION MANAGER

Gary Fishell

#### PRODUCTION COORDINATOR

Gary Fishell

#### GAME DESIGNERS

Gary Fishell

#### SYSTEMS/IT COORDINATOR

Gary Fishell

#### PROGRAMMERS

Gary Fishell

#### TECHNICAL ARTISTS

Gary Fishell

#### AUDIO ENGINEERS

Gary Fishell

#### UX TESTERS

Gary Fishell

# 1 Game Overview

Title: Town Defense  
Platform: PC, MAC AND LINUX Standalone  
Genre: Top-Down Strategy  
Rating: (10+) ESRB  
Target: Casual gamer  
Release date: April, 2016  
Publisher: Slimsy Studios

Description: Assemble and command the defenses to prevent incoming enemies who wish to attack your town! Strategically plan how to defend against the incoming waves of tanks, planes and more! This game will test your ability to make smart decisions with facing consequences of possible town destruction.

## 2 High Concept

Town Defense gives the player the ability to set up unique towers along a dirt path leading to a town. Each level, a wave of increasing enemies will run through this path in attempt to make it to the town and attack. The towers along the way, are equipped with different types of weapons capable of defeating these enemies. It is the players role to ensure that they have placed strong enough towers to deal enough damage to prevent any enemies from making it into their city. Each level becomes increasingly harder with more and stronger enemies to fight off.

## 3 Unique Selling Points

- Amazing sound emmersion
- Quality graphics
- Endless gameplay
- Multiplatform
- Simplistic approach to levels

## 4 Platform Minimum Requirements

PC, MAC AND LINUX STANDALONE  
OS: Windows XP SP2+, Mac OS X 10.8+, Ubuntu 12.04+, SteamOS+  
Graphics Card: DX9(Shader model 2.0) capabilities; almost all graphics card since early 2000's should work

## 5 Competitors / Similar Titles

Heavily inspired by the Bloons Tower Defense series

## 6 Synopsis

Overnight, enemies have convened together and searched for a plan of attack against your town. Luckily, one of your town spies was able to gather this information and bring forth their plan of attack. As town leader, you made the decision to set up all military forces along the path of attack in an attempt to ambush. Exactly how these forces will be used is up to you!

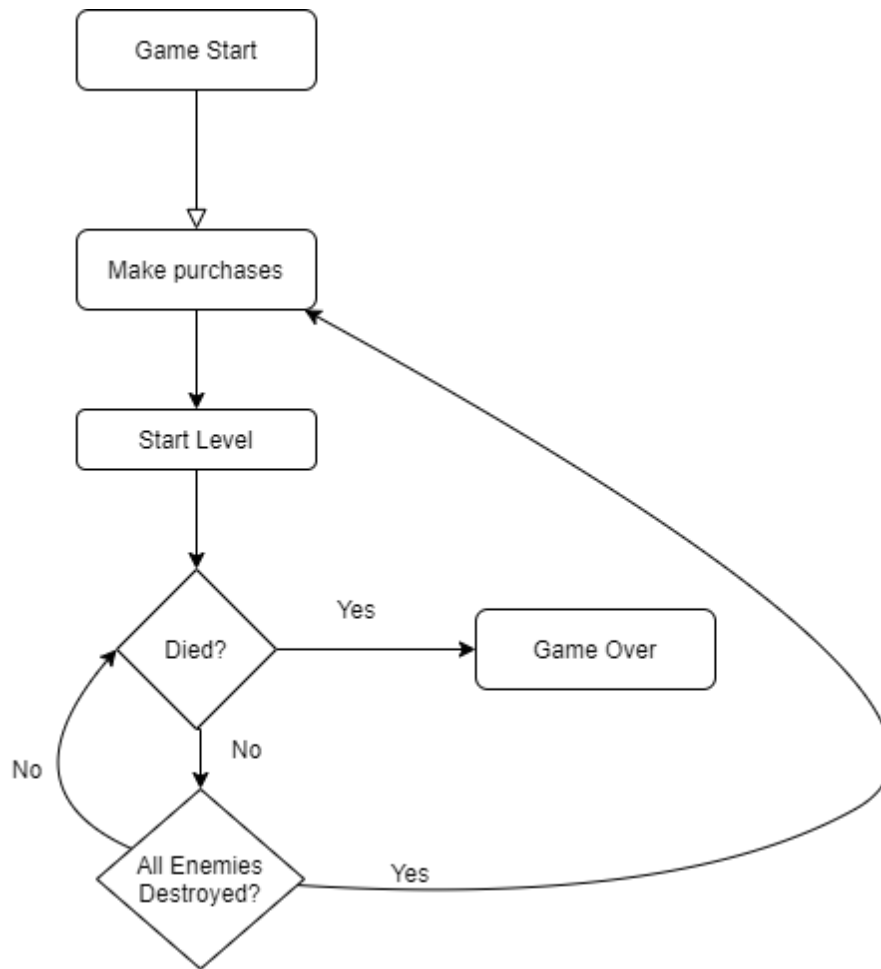
## 7 Game Objectives

The objective of the game is to prevent your town from being overrun by enemies for as long as possible. The longer your town survives, the tougher the enemies coming will be.

## 8 Game Rules

Each level of the game provides a certain amount of enemies that must be destroyed by towers that the player will set up. The player will earn points to purchase more towers by successfully destroying enemies. If an enemy makes it into the players town, a chunk of health will be deducted from the players health bar. Through the use of power-ups, this health can be restored.

## 9 Game Structure



## 10 Game Play

### 10.1 Game Controls

All you will need for this game is your mouse!

### 10.2 Game Camera

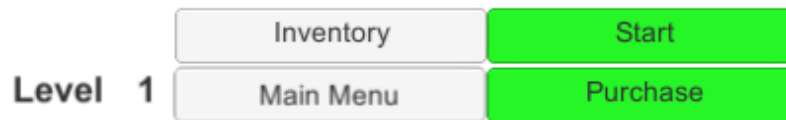
The game is played from a top-down perspective. This allows for the user to have full sight of what enemies are passing through along with where/what towers have been already been placed.

### 10.2.1 HUD

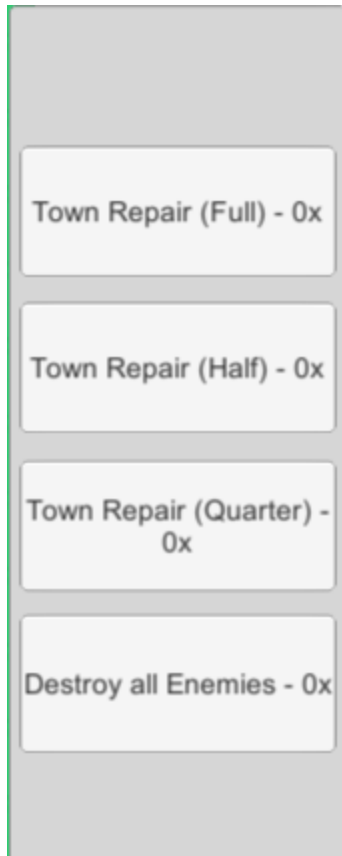
Each HUD element will be described in depth beneath. The HUD is intended to assist the user with controlling the flow of gameplay and making game-changing decisions.



Provided above is the players health and money remaining. This element of the HUD is located in the bottom left corner of the game and is referenced frequently to determine if the player has enough credits to purchase another tower.



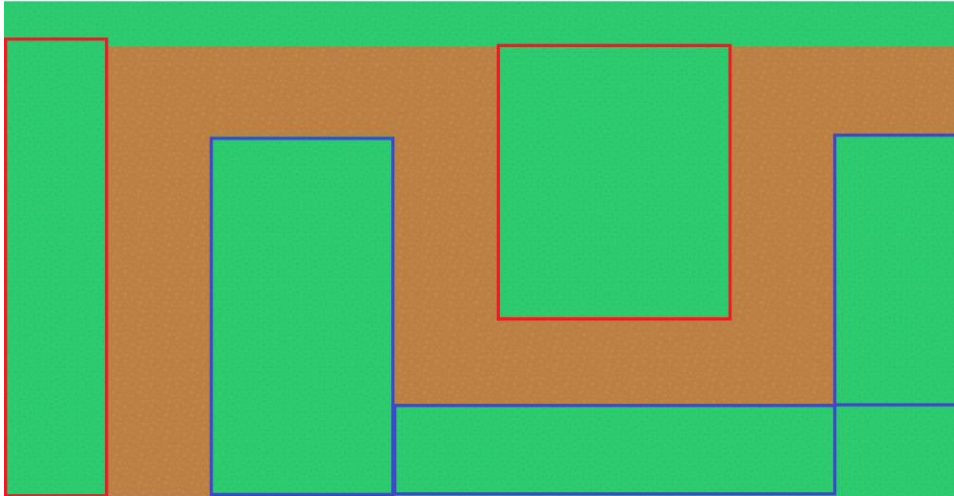
In the above screenshot is the control panel element of the HUD. This element is used to control gameplay flow, make purchases, and access the main menu or inventory. It is frequently referenced by the player to either start the next round or make a purchase.



Lastly we have the inventory management screen. This inventory element is made visible by clicking the Inventory button in the control panel. Unlike the purchase tower screen, the inventory can be accessed at anytime in the game loop. This means a player can use an item in his inventory while enemies are traversing through the path.

### 10.2.2 Maps

Currently, Town Defense features a single map with a brown path that indicates where enemies will pass through. The image below indicates where towers can be placed (blue and red rectangles) along the path to prevent enemies from passing.



## 11 Players

### 11.1 Characters

The player itself does not have a physical representation visible in Town Defense. Instead, the only characters visible are the enemies which are NPC's (See section beneath).

### 11.2 Metrics

**Town Max Health: 100**

**Starting Money: \$2000**

### 11.3 States

**Operational:** This state represents the town having health with a value greater than 0 and indicates that enemies have not overran the town yet

**Destroyed:** This state represents the town has been destroyed and symbolizes a game over state for the player.

### 11.4 Weapons

To assist the player, 4 “weapons” have a chance of dropping after each round. These drops are presented in a round summary at the end of each round.

Name	Effect	Drop Chance
Town Repair (Full)	Add 100 health to town health bar (Max 100)	2% Chance
Town Repair (Half)	Add 50 health to town health bar	10% Chance



	(Max 100)	
Town Repair (Quarter)	Add 25 health to town health bar (Max 100)	40% Chance
Destroy all Enemies	Destroy all enemies on the field and end the round	2%Chance

# 12 Player Line-up

## Enemies



## Towers



# 13 NPC

## 13.1 Enemies

The enemies shown above are generated at the start of each round in a certain combination. For levels 1 through 4, the combination is preset. After level 4, the combination of enemies is randomized with the quantity of enemies increasing each round by five.

### 13.1.1 Enemy States

**Moving Left/Right/Up/Down:** Each enemy has four movement states. The rotation of each enemy changes depending on the direction in which it is heading.

**Death:** This state represents the death of enemy which is achieved by a set of towers depleting the enemies health

**Explosive Death:** The tanks and airplanes have a unique death as they display an explosion animation upon being destroyed by a tower. In addition, an explosion sound is played.

### 13.1.2 Enemy Spawn Points

All enemies will spawn at the beginning of the path which is located at the bottom left of the map.

Enemy	Health	Speed Multiplier	Credits Awarded	Damage to Town
Basic Enemy	15	0.2	17	5
Heavy Enemy	50	0.05	20	15
Weak Fast Enemy	10	0.4	16	3
Cannon Only Enemy	15	0.2	16	5
Basic Tank	200	0.05	25	10
Advanced Tank	225	0.04	50	20
Basic Airplane	100	0.06	25	10
Advanced Airplane	125	0.12	50	20

**NOTE:** After level 15, health of enemies are multiplied by 2, speed multiplied by 2, and their credits awarded are halved. After level 20, health of enemies are multiplied by 3, speed multiplied by 2.5 and their credits awarded are quartered. This is to scale difficulty correctly as there are more enemies spawning.

## 13.2 Allies / Companions

The towers available for the player to purchase are the only present allies within the game. These towers as previously described, will destroy the enemies attempting to enter the town and ultimately allow the player to advance to the next round.

### 13.2.1 Ally States

**Firing:** This state indicates that a tower has locked onto an enemy and is firing its ammunition. For rocker launchers, this is indicated by visible rocket projectiles flying from the tower. For a turret, this is indicated by visible muzzle flash. In addition, all towers have an audible shooting sound that can be heard.

**Reloading:** This state indicates that a tower is loading additional ammunition after previously firing. This may be visible to the player with rocket launchers which have a longer reload time. The player would notice the rocker launcher rotating but no rockets being fired. However for turrets, the reload time is extremely fast and may not be noticed by the player. This is intentional as turrets are supposed to be an expensive but fast way of damaging an enemy.

### 13.2.2 Ally Spawn Points

Spawn points for allies are semi-random. The player can choose whether a tower will randomly spawn on the topside of the path or beneath it. The strategic element introduced here is for the player to balance both sides correctly so that there is ample coverage of enemies that are passing through. Please refer to section 10.2.2 to see available areas in which towers can be placed

Name	Damage	Reload Time	Amount Available
Basic Rocket	10	1.5	Infinite
Big Rocket	20	2	Infinite
Advanced Rocket	10	1	Infinite
Basic Cannon	10	0.15	4
Advanced Cannon	10	0.05	3

## 14 Art

### 14.1 Setting

The game takes place along a basic path that leads on to a town. The enemies are fairly small in comparison to the size of the path as they are being rendered from a top down perspective where the camera is fairly far away from the field.

## 14.2 Level Design

Each level is designed to slowly introduce the player to a more challenging set of enemies than the previous round. Previously mentioned scaling factors insure that the difficulty is dynamic and prevents the player from having the same experience on each iteration.

## 14.3 Audio

Name	Category	Description
Explosion	FX	Played when an explosive enemy is destroyed
ShootingRocket	FX	Played when a rocket launcher is firing a rocket
ShootingTurre	FX	Played when a turret is firing rounds

# 15 Procedurally Generated Content

## 15.1 Environment

No environment variables have been procedurally generated.

## 15.2 Levels

Levels after level 4 are procedurally generated with a varying amount of enemies spawning. Each level increments the amount of enemies by five which are then randomly selected from the set of enemies described.

## 15.3 Artificial Intelligence NPC

Each enemy is able to determine the correct path to follow by utilizing a set of pre-defined waypoints that are placed along the brown path. The waypoint system implemented for enemies is scalable to different levels which could be implemented in the future.

The towers are able to determine the direction an enemy is heading by calculating a distance vector which determines distance and relative position to the turret.

## 15.4 Visual Arts

No graphics have been procedurally generated.

## 15.5 Audio

No audio has been procedurally generated

## 15.6 Minimum Viable Product (MPV)

- Built for PC platform
- Pre-defined set of enemies
- Pre-defined set of towers

## 16 Wish List

- Additional levels
- Procedurally generated maps
- Additional Town Graphic
- A visual player that can assist towers in fighting off enemies

### Works Cited

Kenney Smoke Particles. (2010). Retrieved April 3, 2020, from  
<https://www.kenney.nl/assets/smoke-particles>

Kenney Tower Defense Assets. (2012). Retrieved March 25, 2020, from  
<https://www.kenney.nl/assets/tower-defense-top-down>

Tilemaps in Unity. (2018, January 31). Retrieved April 2, 2020, from  
[https://www.youtube.com/watch?v=ryISV\\_nH8qw](https://www.youtube.com/watch?v=ryISV_nH8qw)

Unity Collisions. (2017, February 26). Retrieved March 3, 2020, from  
<https://www.youtube.com/watch?v=gAB64vfbrhI>

LogoMakr. (2019). Retrieved April 20, 2020, from  
[https://my.logomakr.com/give\\_credit/](https://my.logomakr.com/give_credit/)

All audio, any other artwork (health bars), code and other assets not specified above were developed personally.