

The Outpost

Game Design Document



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1.0 Overview

1.1 Game Title

The Outpost

1.2 Elevator Pitch

The Outpost is a first person shooter that takes the round-based, complex puzzle solving gameplay of *Call of Duty Zombies* and combines it with the campaign and objective-based gameplay of *Left 4 Dead*.

1.3 High Concept

The Outpost is a first person zombie-shooter with RPG elements. Players take on the role of a rookie drafted into the guard of *The Outpost*. Players are sent on missions that take a squad of players through a linear storyline. Each mission will bring a squad to either a new location or return to an old one, where players are presented with a complex, multi-step objective that must be completed. During the course of each objective the storyline will be advanced by various events, interactions and discoveries.

During missions, time is of the essence. The presence of humans brings on wave after wave of increasingly aggravated zombies to the mission area. While there is no time limit, players can only last as long as they are conditioned and prepared for. In between missions players will use their field experience to hone their skills as an outpost guard. However, as the player grows in strength, more complex situations and more powerful enemies will also arise.

The Outpost is a first person zombie shooter that is the round-based, complex puzzle solving of *Call of Duty: Zombies* met with the campaign and objective based gameplay of *Left 4 Dead*. Players will follow a linear storyline that provides them with a series of objective based missions. Each mission will take the players to a new location, or often have the player revisit a prior location. During each mission, the players will be provided with a multi-step, complex, and usually puzzle based objective/obstacle that they must completed. All the while, players are faced with wave after wave of increasingly aggressive zombies, so time is of the essence.

1.4 Genre

The Outpost is, at its core, a first person zombie shooter with RPG elements.

The core gameplay is a round/wave based shooter inspired by *Call of Duty Zombies*. RPG elements come in the form of a cohesive, mission based campaign/story as well as player upgrade/skill trees based on experience.

1.5 Platform

PC, Xbox, Playstation 4, Nintendo Switch

1.6 Key Features/Pillars

Missions

Each mission will deliver and advance the story, and as a result of the transpiring events, create a unique gameplay experience regardless of a familiar environment, team, or loadout.

Equipment

Equipment equates to player survival. Players will find, buy and upgrade weapons that range from reasonable to complete overkill in order to become the ultimate soldier in the Outpost Guard.

Abilities

A soldier is only as good as his training. Players will explore ability upgrade paths that create a character built perfectly for their playstyle.

Co-Op

A good soldier is still only as good as his squad. Because players are specialized, coordinating with your teammates to pick-up where you lack is essential.

Zombies

The presence of humans in an area brings wave after wave of increasingly aggressive zombies to your location. This is a psychological effect of the chemical that infects the zombies. Leaving a location will allow their aggression levels to return to normal.

2.0 Narrative Architecture

2.1 Specifications

- Story Type
 - Linear
- Devices/Mechanisms/Delivery
 - Scripted Events
 - Dialogue

2.2 Setting

The year is the present day, but in another timeline/reality, the season is Autumn. The Outpost is located in the remote foothills of a California mountain range, putting it safely out of range of high population, zombie-ridden areas. Being in the foothills of California mountains, The Outpost is relatively close to a variety of different

settings including forests, mountains, deserts, beaches, urban and suburban areas, and many more of California's diverse environments. Missions/the story will take the player to these various locations.

2.3 Protagonist

The player(s) take on the role of a rookie drafted into The Outpost Guard. The player will determine their particular character's background when choosing their class - each of which have a particular skill set that is indicative of a given up-bringing (see: [Player Controlled Character](#)). Ultimately the character's backstory has little importance in comparison to the events that will unfold during the course of this game.

As the players' characters progress along with the story, they will become an elite squad of soldiers within The Outpost Guard, as a result of their honed skill sets.

2.4 Backstory

In an alternate universe, the nuclear arms race we know in our world never happened. As a result, chemical warfare continued to evolve in increasingly sick and disturbing ways.

The year was 1984. The aggressive, fascist nation of Canada executed multiple chemical strikes across the globe using an unnamed chemical formula that later became known as Black Mist.

The Black Mist made sane people crazed, and the crazed crazier. Some survivors tried to creatively call them things other than zombies, but that's dumb because they were totally a textbook case of zombies. The difference here was no patient zero, as the majority of the world population fell to the black mist within a day either in direct attacks or the fallout. Not even the god damn Canadians made it. The prepared and a lucky few found themselves safe from the attacks. Overnight the world turned into a primordial fight for survival.

This will be presented as an opening cinematic

2.5 Synopsis

The majority of the story will be conveyed to the player through mission briefings and dialogue between players and NPCs. Cinematics will be used sparingly.

Act 1

The player and their squad mates are new recruits in The Outpost Guard. The squad is sent on several standard fare missions - supply runs, scouting missions, etc. During this time, there are clear indications that the zombie problem is getting worse. The zombies are both evolving into more aggressive, intelligent and dangerous forms, and their numbers continue to grow.

As the player's squad continues to grow in experience they are sent on more important missions, where several discoveries are made. During a mission to a city, where zombies thrive in the highest numbers due to the population density at the time at the attacks, players become aware that the zombies are actually reproducing. Further investigation reveals that the zombies are beginning to organize in primitive forms with the more evolved zombies leading this movements.

The threat is minimal at the moment, but it will only continue to grow with time. The Outpost Elders gather to discuss options. There are opposing sides, but the two main parties are to push all resources to develop a way to eliminate all zombies, or push all resources into developing a cure. Researchers indicate that a breakthrough on both sides is relatively close.

Act 2

The players are sent on missions for both the destruction and for the cure. While completing a mission for delegation with another outpost, the players are a part of an important discovery, the other outpost has come into possession of a unique specimen - a hybrid child. The child is a zombie, yet has the sentience and intelligence of a human. The Outpost makes it clear that this could be a major breakthrough for the cure. The other outpost has little scientific resources and are seeking to sell the hybrid child. At this point a horde of zombies are coming in so a decision must be made quickly - on the orders of The Outpost, you take the child.

There are issues with people in The Outpost attempting to murder the child, as well as outside forces breaching The Outpost walls for the same reasons. As a result, your team is sent to a remote research station in the mountains.

Act 3

The players go through a series of escort missions to take the child to the research station, during which many obstacles are encountered.

The players reach the remote research station, delivering the child. The players are sent on several missions to get the research station up and running. Zombies begin to close in on the station, threatening the progress of the research, which is almost at a close. The players engage in a last ditch effort to defend the station against the horde. It comes down to the wire, but the players persevere. The players activate dispersal units around the research station, which then release the cure in gas form.

The zombies halt their attack, as they begin a slow and painful healing process. Evolved forms of zombies are too far gone and do not survive the cure. The players take a moment of rest as the formula to the cure is sent out across the world, knowing that they had played a part in the survival of humanity.

3.0 Gameplay Loops

3.1 Primary Loop

- Assess
 - The player assesses the state of things like the room, their ammo, and their teammates' health and positions to inform whether or not they need to change their current behavior/target/priority or continue as-is.
- Move

- Players will always need to be moving, because zombies will be chasing them. Where the player is moving towards or away from is informed by their previous assessment.
- Shoot
 - The player will be constantly bombarded by zombies, shooting at targets is core to moment to moment survival.

3.2 Secondary

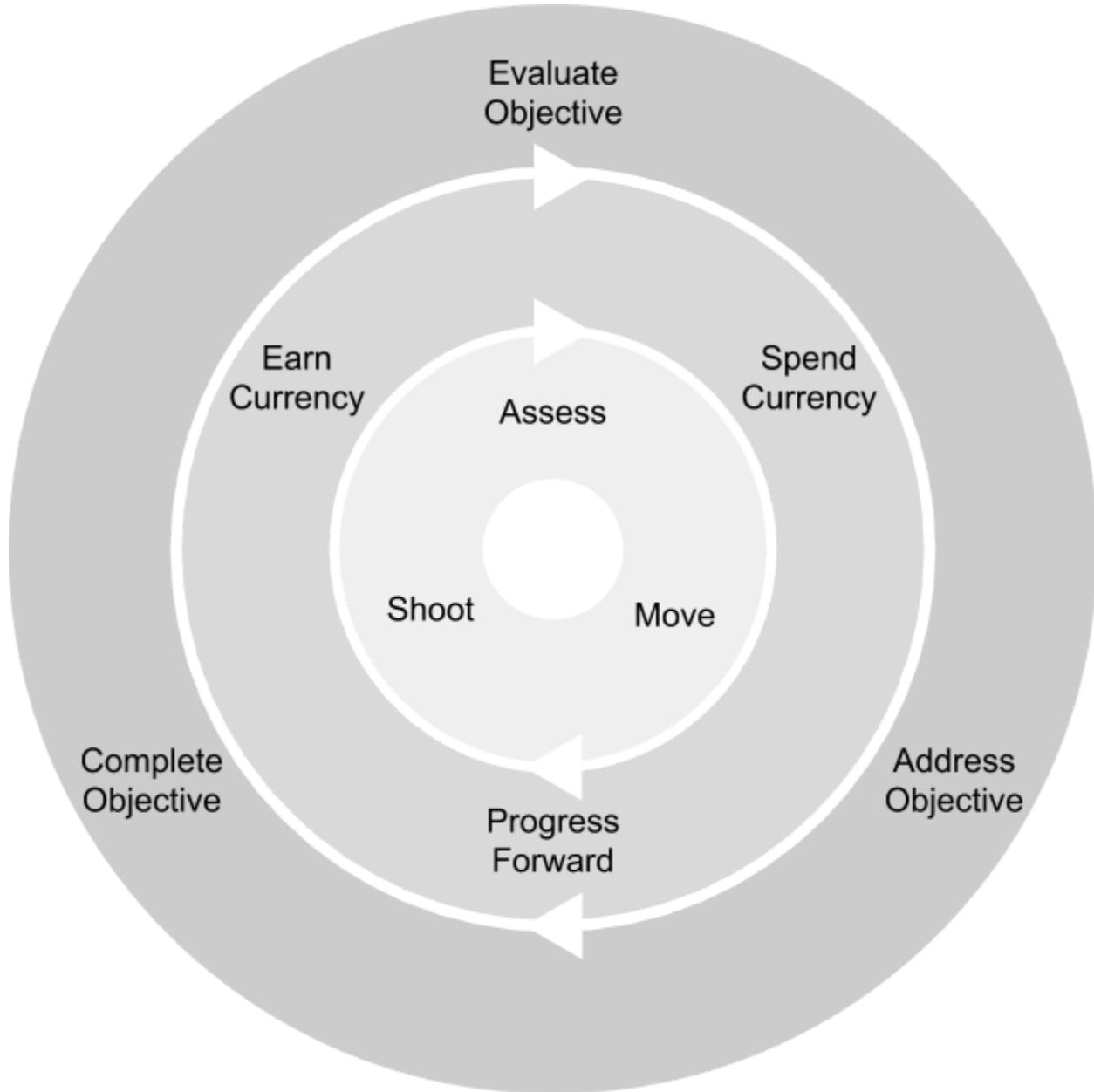
- Earn Currency
 - By killing enemies players will earn points. These points are the currency with which the player will progress as a team/individually.
- Spend Currency
 - Players will use their gained currency to either open up new areas of the level, clear certain level objectives, or buy/upgrade their arsenal.
- Progress
 - As a result of a player spending money, the player will either be better equipped or the team will progress forward in regards to more area access or the overall objective.

3.3 Tertiary Loop

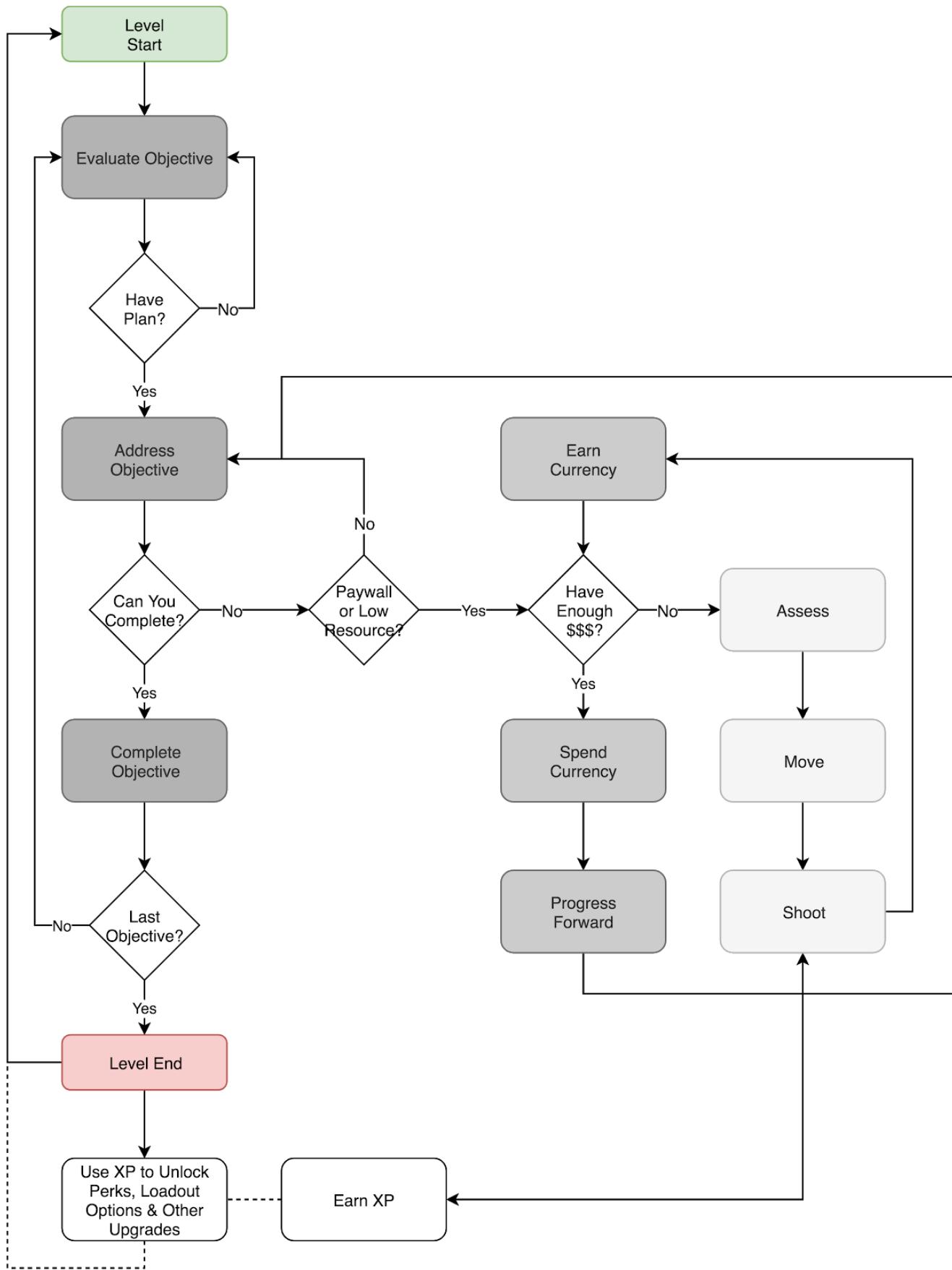
- Evaluate Objective
 - Using the information provided to them, what has already been accomplished, and the state of the team, the players will decide what their current objective should be. It is at this stage that players hypothesize how to best complete their objective as well. This objective could be related to the main level objective, or something as simple as ensuring a downed player can be revived.
- Address Objective
 - Utilising the Primary and Secondary loops, the players will take various actions to progress towards completing the objective. For example, if the goal is the classic objective of turning on the power, players will move towards the switch, eliminate zombies in the way and unlock any doors that obstruct the path.
- Complete Objective
 - The players will arrive at, solve or otherwise complete the objective that was previously evaluated. If the completed objective is the last stage of the main level objective, an end/exit to the level will be triggered/opened up.

3.4 Diagrams

Loop Diagram



Flow Chart



4.0 Player Controlled Character

4.1 Overview

There are 4 unique classes that players can choose from. Technicians focus on dealing damage, Chemists focus on powering up teammates, Engineers focus on building helpful contraptions, and Mechanics focus on protecting teammates.

4.2 Classes & Attributes & Abilities

Classes

Technician

“Technicians are the boots on the ground expertise every team needs..”

This is a fairly standard DPS type character, with a focus on shooting equipped weapons and maximizing damage. This is a welcoming role.

This class has a charged ability that allows the player to dual wield weapons for a period of time. This allows the player to increase their damage output, at the expense of being able to ADS.

Additionally this character has a passive ability that makes all weapons fire at a faster rate, further increasing damage output.

Mechanic

“Mechanics operate tank-like exosuits that can take a beating...”

Mechanics are a fairly standard tank class, focused on drawing enemy attention and aggression away from teammates. This is a welcoming role.

Their charged ability, attention hog, emits a loud noise as well as a pheromone that draws the attention of every zombie on the map. This provides a moment for other players to recover and refocus strategy.

Additionally this class has an enhanced sprint that allows the player to charge through a mob of zombies. Unfortunately, this class can only sprint in short bursts, so timing is important.

Chemist

“Chemists concoct powerful substances that push the bounds of human capability...”

In place of a traditional healer is a character that is focused on dealing out various perks to their team as a form of aid. This is a very strategic role.

This class is focused around its charged ability to concoct various perks (armor ++, stamina ++, etc). These perks only last a certain amount of time and range from being helpful in a variety of situations, to very specific situations.

Additionally this class has a passive ability that makes all perks last longer when self applied.

Engineer

“Engineers constructions are the first and last line of defense...”

Engineers are a class focused on building traps and defenses. The goal is that this player can simultaneously be on the front lines attacking while also protecting the rear. This is a strategic role.

This is done primarily through the charged ability to build offensive traps and defensive structures. Offensive traps are things like turrets or proximity mines. Defensive structures are things like entrance blockers or funneling barricades.

Additionally, a passive ability increases melee damage dealt to all enemies by a significant amount. This allows the player to more easily defend their contraptions.

Attributes

Each class shares the following attributes, equalling a total of 12 points. The distribution of points to each attribute is part of what makes each class unique.

1. Vitality - Represents both health and defense. Zombies deal a flat rate of damage, and based off a players vitality, they can take more or less hits before being downed.
2. Stamina - Controls the length of time players can perform exhausting actions, primarily sprinting.
3. Marksman - Represents the class's skill at using weaponry. Affects weapon sway, reload speed, and aimed movement.
4. Expertise - Represents how quickly the player's unique class ability charges.

Class	Vitality	Stamina	Marksman	Expertise	Total
Technician	3	3	5	1	12
Chemist	2	2	3	5	12
Engineer	3	5	2	2	12
Mechanic	5	1	3	3	12

Abilities & Actions

Class	Navigation	Attack	Passive	Charged
Technician	Walk, Sprint, Crouch	Shoot, Melee, Grenade	Fire Rate ++	Dual Wield
Chemist	Walk, Sprint, Crouch	Shoot, Melee, Grenade	Perk Time ++	Concoct Perk
Engineer	Walk, Sprint, Crouch	Shoot, Melee, Grenade	Melee ++	Build Trap
Mechanic	Walk, Sprint, Crouch	Shoot, Melee, Grenade	Sprint ++	Attention Hog

4.3 Player Controls

Button	Action	Description
A Button	Jump	Triggers players jump action
B Button	Crouch	Toggles player in and out of crouched state
X Button	Reload/Interact	Triggers a weapon reload if available, triggers interaction if available
Y Button	Swap Gun	Swaps between weapons if the player has more than one equipped
RB (Right Bumper)	Grenade	Triggers grenade throw on button release, allowing grenade cooking
LB (Left Bumper)	Use Ability	Activates the player's class ability if it is available
LB (Hold)	Ability Menu	Brings up radial menu for configurable abilities (ex: Chemist perk selection)
RT (Right Trigger)	Shoot	Shoots/Uses the equipped weapon at value > 0.15
LT (Left Trigger)	Aim	Engages Aim Down Sight, value = 0 is off, value > 0.15 is on
RS (Right Stick)	Camera	Controls camera based on X and Y axis. Invert options available.
RS (Press)	Melee	Triggers melee attack using equipped melee weapon
LS (Left Stick)	Move	Moves player based on X and Y axis
LS (Press)	Sprint	Toggles sprinting on and off, if stamina is available



5.0 Camera & HUD

5.1 Camera

The camera for this game is a standard First Person setup. The camera's rotation is completely player controlled, and the camera's position precisely follows the player without any smoothing or delay. The camera is placed about where the player character's head would be, and follows the height of the player (un-crouched/crouched).

The player has control of the Pitch (X-Axis) and Yaw (Y-Axis). Camera rotation is clamped at the top by about 15 degrees, and clamped at the bottom by about 30 degrees. This is to prevent any over-rotation disorientation from occurring.

The camera's field of view changes in several circumstances. The FOV will open up when the player is sprinting. The FOV will narrow by varying amounts when the player uses the ADS system, depending on the equipped weapon.

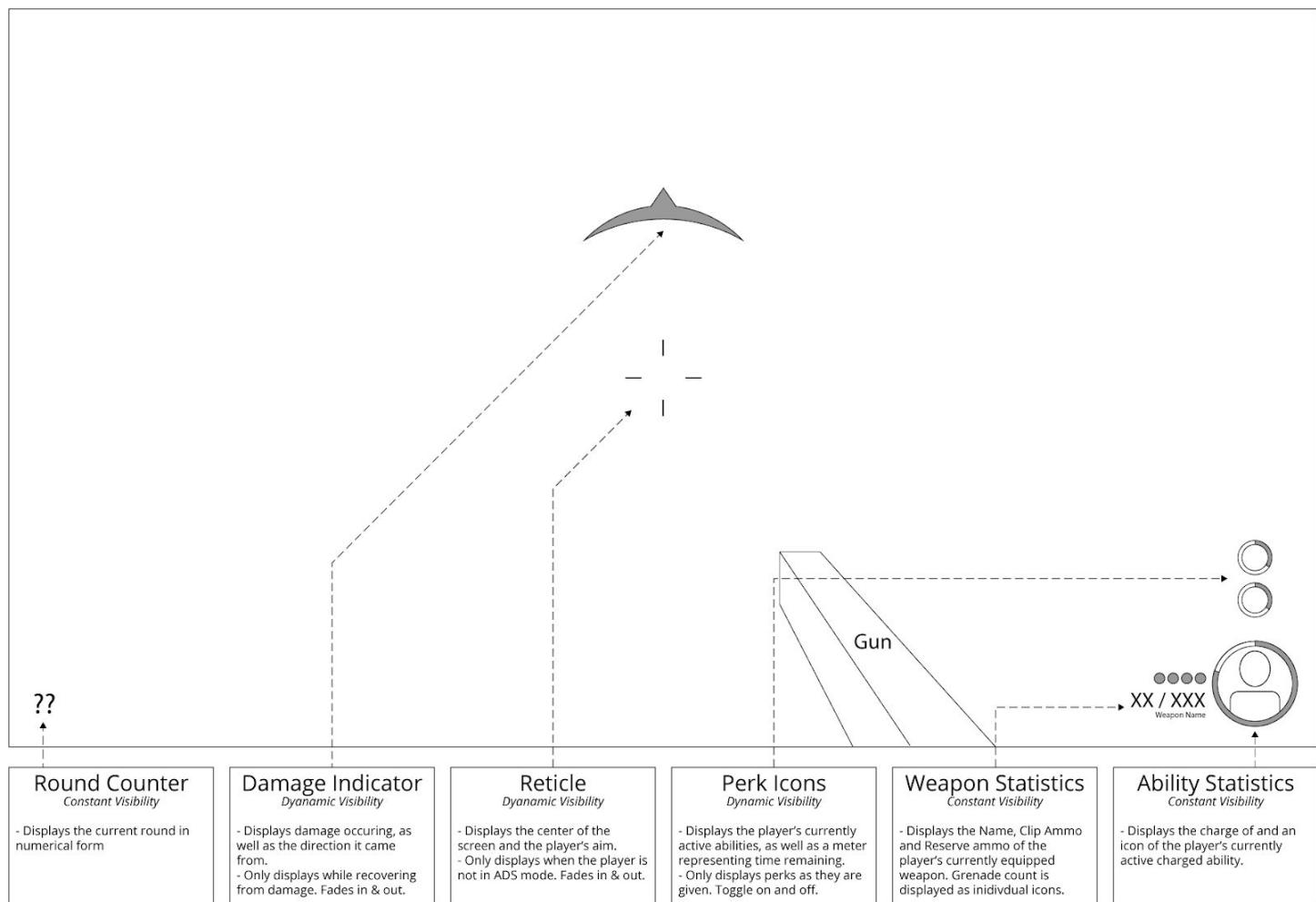
All of these qualities make this camera behave predictably, but allows for small amounts of feedback to come through the camera's motion. This puts the player in charge of every moment of gameplay.

5.2 HUD

Things that will be shown on the HUD:

UI Item	Visibility	Description
Reticle	Dynamic	Only visible while player is not in ADS
Player Damage	Dynamic	Only visible while player is recovering from damage
Current Round	Constant	Displays: Current round number.
Weapon Statistics	Constant	Displays: Weapon Name, Clip Ammo, Reserve Ammo
Ability Statistics	Constant	Displays: Current Charge, Selected Ability Icon
Perk Statistics	Dynamic	Displays: Currently active perks, and time remaining

HUD Wireframe



HUD Mock-Up



6.0 Progression

6.1 Summary

The main progression system for players will be an experience-based level system. The player's experience growth will follow an equation like the following:

$$(Player\ Level^2 * 42) + (Player\ Level * -42) = Experience\ to\ Next\ Level$$

There is a level cap at level 45.

In addition to achieving a higher level, players will also get skill points to distribute among 3 categories: Armor, Damage, and Ammo. When the player puts a point into any one of these categories, the base stat multiplier for a given stat will increase (see chart below for specifics). The most points that can be put into a single category

is 15. As there are 3 categories with 15 points each, and a level cap of 45, players will be able to max out their stats by reaching top level.

To prevent every player build from being the same by late game, every 5 levels, players will be presented with at least 2 permanent perks to choose one of. To be clear, this situation is an either/or situation, the player will never be able to choose both. The perk combination options are unique to each class, however the perks themselves are not always going to be exclusive to a single class (for example, a perk that increases melee damage might occur in multiple classes but at different stages of progression).

Separate from these systems, the players unique class ability will unlock and become available at level 5.

6.2 Charts

Experience/Level Progression

Level	XP to Next Level	Delta	16	10080	1260	31	39060	2520
1	0		16	10080	1260	31	39060	2520
2	84	84	17	11424	1344	32	41664	2604
3	252	168	18	12852	1428	33	44352	2688
4	504	252	19	14364	1512	34	47124	2772
5	840	336	20	15960	1596	35	49980	2856
6	1260	420	21	17640	1680	36	52920	2940
7	1764	504	22	19404	1764	37	55944	3024
8	2352	588	23	21252	1848	38	59052	3108
9	3024	672	24	23184	1932	39	62244	3192
10	3780	756	25	25200	2016	40	65520	3276
11	4620	840	26	27300	2100	41	68880	3360
12	5544	924	27	29484	2184	42	72324	3444
13	6552	1008	28	31752	2268	43	75852	3528
14	7644	1092	29	34104	2352	44	79464	3612
15	8820	1176	30	36540	2436	45	83160	3696

Skill Point Category Progression

Armor

Level	Multiplier	Example
0	0%	2
1	50%	3
2	100%	4

Damage

Level	Multiplier	Example
0	0%	2000
1	2%	2040
2	4%	2080

Ammo

Level	Multiplier	Example
0	0%	256
1	10%	282
2	20%	307

3	150%	5	3	6%	2120	3	30%	333
4	200%	6	4	8%	2160	4	40%	358
5	300%	8	5	10%	2200	5	50%	384
6	350%	9	6	13%	2260	6	70%	435
7	400%	10	7	16%	2320	7	90%	486
8	450%	11	8	19%	2380	8	110%	538
9	500%	12	9	22%	2440	9	130%	589
10	600%	14	10	25%	2500	10	150%	640
11	650%	15	11	30%	2600	11	170%	691
12	700%	16	12	35%	2700	12	190%	742
13	750%	17	13	40%	2800	13	210%	794
14	800%	18	14	45%	2900	14	230%	845
15	900%	20	15	50%	3000	15	250%	896

Perk Progression

Technician

Milestone	Armor Perks	Damage Perks	Ammo Perks
1	Regen Armor ++	Grenade Damage ++	Reload Speed ++
	Chemical Resistance ++	Melee ++	Magazine Size ++
2	Fire Resistance ++	Headshot Damage ++	Guns ++
	Explosion Resistance ++	Armor Damage ++	Armor Damage ++
3	Ability Use: Armor ++	Damage Perks ++	Bullet Penetration ++
	Ability Duration ++	Ability Damage ++	Bullet Fire Damage ++

Mechanic

Milestone	Armor Perks	Damage Perks	Ammo Perks
1	Armor ++	Accuracy ++	Kill: Ammo ++
	Regen Armor ++	Fire Rate ++	Reload: Armor ++
2	Sprint Speed ++	Handling ++	Ability Use: Ammo ++
	Sprint Duration ++	Reload Speed ++	Reload: Cooldown --
3	Ability Duration ++	Kills: Cooldown --	Magazine Size ++
	Ability AOE ++	Headshots: Cooldown --	Ammo Capacity ++

Chemist

Milestone	Armor Perks	Damage Perks	Ammo Perks
1	Armor Concoction Strength ++	Damage Concoction Strength ++	Ammo Concoction Strength ++
	Armor Concoction Duration ++	Damage Concoction Duration ++	Ammo Concoction Duration ++

2	Ability Use: Apply to Self ++	Ability Use: Damage ++	Brewing Duration --
	Ability Use: Apply to Team ++	Ability Use: Fire Rate ++	Concoction Uses ++
3	Concoction Slots ++	Concoction Slots ++	Concoction Slots ++
	Concoction Splash Area ++	Enemy Effect ++	Concoction Uses ++

Engineer

Milestone	Armor Perks	Damage Perks	Ammo Perks
1	Craft Armor ++	Contraption Damage ++	Contraption Ammo ++
	Contraptions: Team Armor ++	Contraptions: Team Damage ++	Contraptions: Team Ammo ++
2	Contraptions: Team Dmg Taken --	Contraption Damage Rate ++	Simultaneous Contraptions ++
	Contraption Damage Taken --	Ability Duration ++	Contraption Slots ++
3	Ability AOE ++	Contraption Fire Damage ++	Contraption Death: Explosion ++
	Contraption Damage Taken --	Melee Fire Damage ++	Contraption Death: Ammo ++

6.3 Perk Glossary

Perk Name	Perk Definition
Ability Damage ++	Damage output increased during class ability use
Ability Duration ++	Duration of class ability increased by a given amount
Ability Use: Apply to Self ++	(Chemist) Using a concoction also applies its effects to the giving player
Ability Use: Apply to Team ++	(Chemist) Using a concoction also applies its effects to the other team members
Accuracy ++	Overall accuracy is increased (weapons sway, recoil reduced)
Ammo ++	Current ammo reserve increased by a given amount
Ammo Capacity ++	Reserve capacity increased by a given amount
Armor ++	Current armor amount increased by a given amount
Armor Damage ++	Damage dealt to enemy armor is increased
Brewing Duration --	Time to brew a concoction is reduced
Bullet Fire Damage ++	Fire damage has a chance of being applied to normal bullet damage
Bullet Penetration ++	Bullets can pass through more enemies before stopping (increased collateral)
Chemical Resistance ++	Resistance to chemical damage increased
Concoction Duration ++	Duration of concoction is increased
Concoction Slots ++	The number of concoction types a player can brew is increased
Concoction Splash Area ++	Increases the AOE that applies to enemies of thrown concoctions
Concoction Strength ++	Strength of concoction is increased
Concoction Uses ++	The number of concoctions a player can brew before cooldown is increased
Contraption Ammo ++	The amount of ammo reserve a contraption has is increased
Contraption AOE ++	The AOE of a contraption's passive effects is increased
Contraption Damage ++	The damage output of a contraption is increased
Contraption Damage Taken --	The damage a contraption takes from enemies is reduced

Contraption Death: Ammo ++	When a contraption is destroyed by enemies, ammo refills are dropped
Contraption Death: Explosion ++	When a contraption is destroyed by enemies, grenades are dropped
Contraption Fire Damage ++	Fire damage has a chance of being applied to contraption bullet damage
Contraption Slots ++	The number of contraption types a player can construct is increased
Contraptions: Team Ammo ++	While contraptions are active, team members in AOE will regenerate ammo
Contraptions: Team Armor ++	While contraptions are active, team members in AOE will regenerate armor
Contraptions: Team Damage ++	While contraptions are active, team members in AOE will deal more damage
Contraptions: Team Dmg Taken --	While contraptions are active, team members in AOE will receive less damage
Cooldown --	Ability cooldown is reduced by a given amount
Craft Armor ++	Allows the player to pay to construct ammo for themselves or team mates
Damage ++	Damage output increased by a given amount
Damage Perks ++	Perks affecting damage have increased effect
Enemy Effect ++	The negative effect a concoction applies to enemies is increased
Explosion Resistance ++	Resistance to explosion damage is reduced
Fire Rate ++	The rate at which a weapon deals damage is increased
Fire Resistance ++	Resistance to fire damage is reduced
Grenade Damage ++	Damage done by grenades is increased
Guns ++	The player can carry an additional gun
Handling ++	The speed at which a player switches between weapons and ADS is increased
Headshot Damage ++	Damage done by headshots is increased
Magazine Size ++	The magazine size of all weapons is increased
Melee ++	Melee Damage is increased
Melee Fire Damage ++	Fire damage is added to melee attacks
Regen Armor ++	The rate at which armor passively regenerates is increased
Reload Speed ++	The speed at which guns reload at is increased
Simultaneous Contraptions ++	The ability to have more than one active contraption
Sprint Duration ++	The duration a player can sprint for is increased
Sprint Speed ++	The speed at which a player sprints at is increased

7.0 Combat System

7.1 Enemy Units

Each of these zombies is a melee focused character. Before attacking the player, a swing will be briefly telegraphed to the player with a wind-up, however this time period is very small. Essentially, getting in range of these enemies means getting hit unless you go in for an attack and get out very quickly.

Standard Zombie

Type: Smasher/Fodder

Amount: Abundant - represents the majority of enemies

Appearance: Varies depending on the location of a particular level. Usually regular citizens wearing tattered/worn streetwear.

Gimmick: There is nothing special about this type of enemy, other than the fact they are dangerous in large amounts.

Strategy: As per zombie tradition, the quickest way to dispatch this enemy is with a quick headshot.

Purpose: Populate the world with moderately dangerous enemies.



reference

Military Zombie

Type: Emphasizer

Amount: Uncommon - shows up every now and then

Appearance: Wears military uniform (WWII style), with a kevlar helmet and bullet proof vest.

Gimmick: This enemy's kevlar helmet and vest are both cosmetic and functional. This helmet prevents the player from making easy headshots on the enemy. Headshot damage cannot be inflicted on this enemy until the helmet's durability is depleted and it is knocked off. Similarly, the bulletproof vest reduces the effectiveness of body shots.

Strategy: Because the head is temporarily invulnerable and the vest reduces effectiveness of body shots, players have to decide how they want to approach this enemy. One method is to attack the head and reduce helmet durability to go for a headshot kill. Another method is to pile ammo into the body of the zombie, killing it with brute force.

Purpose: This enemy exists to introduce the player to the concept of armor durability as well as resistance. To disrupt player settling into gameplay and keep them on their toes.

Emphasizes to the player that where they shoot matters, beyond typical damage conventions.



reference

Armored Zombie

Type: Enforcer

Amount: Rare - Show up on a schedule

Appearance: A visceral enemy. This is a zombie that has fed enough and grown biologically. Clothes are gone, and armor-like bone growths have broken through skin to cover all vital areas such as the head, chest, arms and legs.

Gimmick: The armor-like bone growths cover most the body with durability-based armor. Damage cannot be inflicted on this enemy until armor is broken through in a particular area. There are gaps in the armor that the player can shoot at, but this is difficult in motion. Additionally, this advanced enemy moves slightly quicker than other zombies.

Strategy: Much like the military zombie, the player will need to choose where to shoot this zombie. They can aim for the larger target of the body to do normal damage after breaking armor, or aim at the smaller head target for heat shot damage. The trade off here is that because the head is a smaller target, if the player's aim is not dead on, it might be less effective to go for the head.

Purpose: *Enforce* the player to strategically attack particular locations of this enemy. This is a mini-boss of sorts as well.



reference

Colossus Zombie

Type: Challenger

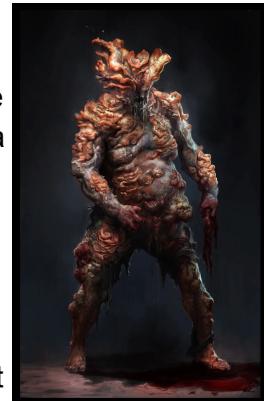
Amount: Very Rare - Shows up under specific circumstances

Appearance: An even more visceral enemy. This enemy is a further evolved version of the armored zombie. The armor-like bone growths have covered almost the entire surface area of the zombie. Additionally, bone growth has made this zombie massive in comparison to common zombies and humans.

Gimmick: The armor-like bone growths cover the entire body with durability-based armor. Damage cannot be inflicted on this enemy until armor is broken through in a particular area. There are no gaps. Additionally, this enemy is so advanced that it's armor will slowly regenerate if not taking damage. Because of the amount of armor and size of this enemy, it is quite slow.

Strategy: Much like the armored zombie, the player will have to strategically choose an area to attack. Because this enemy can regenerate armor, cooperation with teammates is essential in dealing damage to this enemy.

Purpose: *Challenge* the players by testing their understanding of how zombie armor works, and how to best use their weapons in conjunction with their teammates. This is a boss type enemy.



reference

7.2 Enemy Attributes

Attribute Definitions

Health

This is the health that an enemy has. This is a stat does not change and does not vary within a class. This attribute is affected by taking into account what attacked the zombie, and where the zombie was attacked, as well as as the zombie's current resistant.

Resistance

The resistance of a zombie is essentially the defense a zombie has against player weapons and attacks. This stat increased in association with the current round - the higher the round, the higher the resistance. As a result this stat is what creates the primary difficult ramp.

Attack

This is the damage that the enemy is capable of inflicting in an attack. This stat does not change over time, and does not vary within a class.

Speed

This is the base speed that the zombie moves and attacks at. This number represents the average movement speed - so the actual number for each individual enemy will vary. Additionally as rounds increase, this speed will as well. This base number also influences the speed at which attacks are telegraphed and executed at.

7.3 Attribute Matrix

Zombie	Health	Resistance	Attack	Speed
Standard	10	1.0	1	4 m/s
Soldier	12	1.0	1	4 m/s
Armored	15	1.2	2	5 m/s
Colossus	21	1.5	3	2.5 m/s

7.4 Zombie Progression

This is essentially the increased difficulty players will face, the longer they stay in a location. This means that players are never hard limited by time, but survival will become increasingly difficult as time goes on.

Essentially every round will increase 3 different enemy stats:

1. Amount of Zombies

2. Health of Zombies
3. Speed/Aggression of Zombies

Amount of Zombies

The amount of zombies per round is simply the previous round amount, plus an additional 4. Alternatively, it can be determined using a simple linear equation:

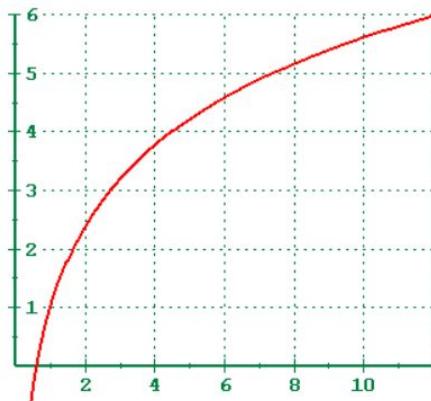
$$(Current\ Round + 1) * 4 = Zombie\ Amount$$

For performance reasons, only a certain number will appear at a time. The round will end when the amount of zombies killed equals the total amount of zombies that should spawn.

Health of Zombies

Because the number of zombies increases every round, the player will have a constant, ever growing challenge. The Health of the zombies makes up for this by following an logarithmic decay model, seen in the following equations & model:

$$a + b \ln x$$



The result is that difficulty ramps up quickly over the first dozen or so rounds, but levels off to a more reasonable difficulty growth rate in the later rounds.

The exact number of this algorithm will need lots of tuning and testing to find the best balance

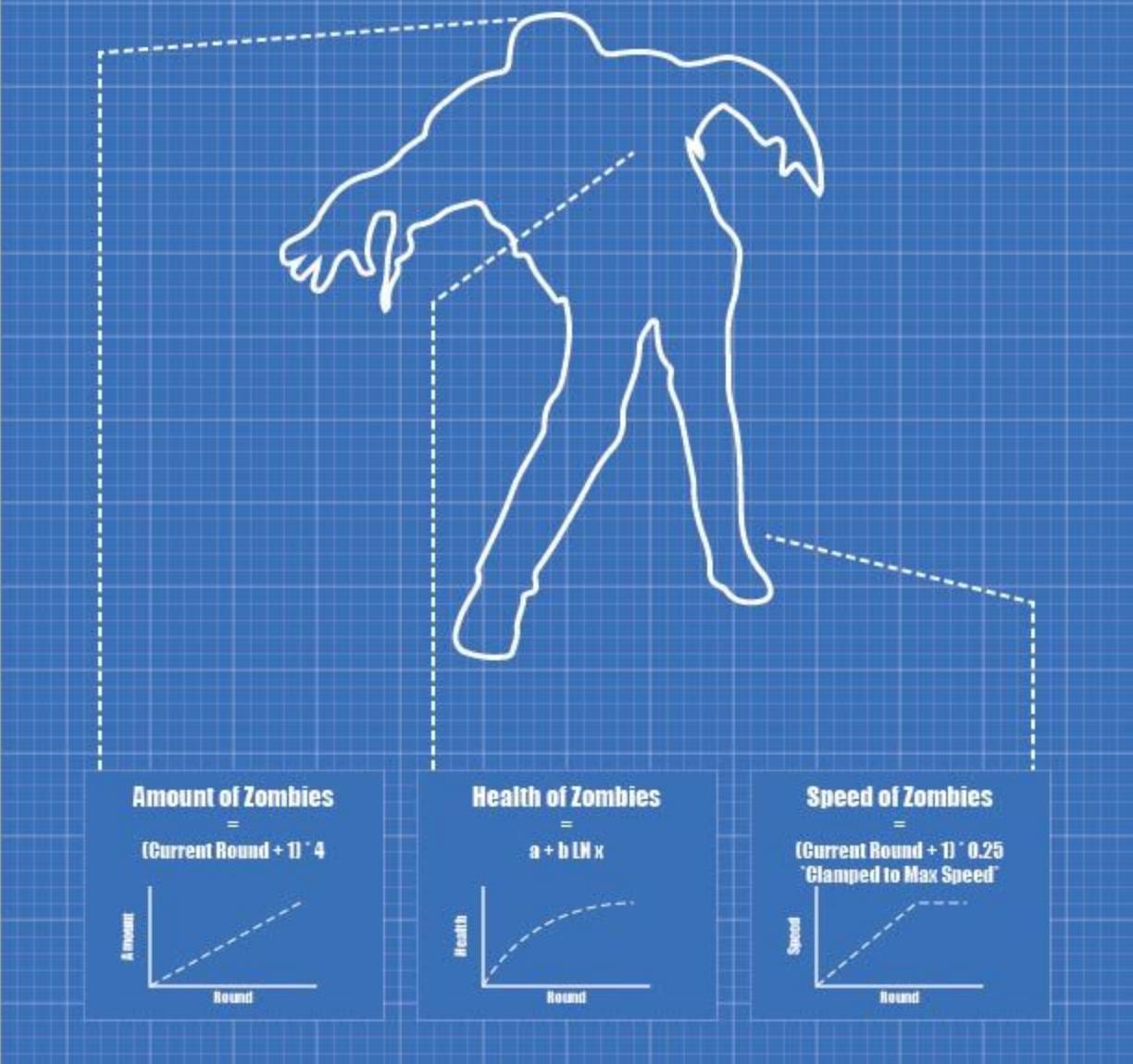
Speed of Zombies

Unlike the other traits, at a certain point in the game, this trait stops growing. This is because the zombies should not move and attack quicker than the players can, on average.

The growth rate of the zombies' speed is simply +0.25m/second per round. This is clamped by the max speed allowed by a particular zombie type. This can be represented by the following:

$$(Current\ Round + 1) * 0.25 < Max\ Zombie\ Speed$$

The Zombie Mob Progression



8.0 Weapons

8.1 Weapon Matrix

Weapon	Class	Fire Type	Fire Rate			Clip Size	Reserve	Reload Speed		Recoil	Cost
			Damage	(rounds/s)	DPS			Speed	Medium		
AR-15	Rifle	Full Auto	100	10	1000	32	256	2.1s	Medium	\$2,200	
AK-47	Rifle	Full Auto	100	12	1200	24	224	2.5s	High	\$2,500	
M-14	Rifle	Semi Auto	120	∞	120 +	16	96	2.4s	Low	\$1,800	
M-16	Rifle	Burst (3)	135	6	810	30	360	2.0s	Medium	\$2,100	
1911	Handgun	Semi-Auto	20	∞	20 +	8	80	1.6s	Low	\$0	
M-9	Handgun	Semi Auto	85	∞	85 +	12	120	1.6s	Low	\$750	
CZ75	Handgun	Full Auto	80	8	640	15	135	1.6s	Medium	\$1,400	
Magnum	Handgun	Semi-Auto	124	2.5	310	6	72	2.2s	High	\$1,600	
Double Barrel	Shotgun	Single Fire	300	∞	300 +	2	54	3.1s	High	\$1,300	
Pump Action	Shotgun	Pump-Action	250	1.5	375	6	72	0.5s/shell	High	\$1,500	
SPAS-12	Shotgun	Semi-Auto	200	2.5	500	10	90	0.6s/shell	High	\$1,900	
AA-12	Shotgun	Full Auto	200	3	600	15	75	2.2s	Extreme	\$2,100	
UZI	SMG	Full Auto	85	14	1190	25	250	2.1s	High	\$1,600	
MP5	SMG	Full Auto	70	14	980	28	280	1.9s	Medium	\$1,800	
UMP	SMG	Full Auto	60	15	900	32	256	1.8s	Medium	\$1,800	
MP40	SMG	Full Auto	50	16	800	32	448	1.6s	Medium	\$2,000	

8.2 Weapon Types

Rifles

Rifles are arguably the most useful weapons in the game. Their high rate of fire combined with their high damage equates to some of the highest damage output.

The AR-15 and AK-47 are quite similar but slight differences make them valuable for different reasons. The AR-15 has a lower DPS, yet it has a larger clip size and reserve size, additionally it reloads quicker and is more accurate. The AK-47 is more powerful, but its smaller clip size and high recoil make it less reliable in a variety of situations.

The M-14 is the only semi-auto rifle. Its theoretical DPS is infinite, but is limited by clip size. This gun is less useful than the other rifles on paper, but its higher per-bullet damage and accuracy makes it an interesting proposition to certain players, especially given its price.

The M-16 provides players with a reliable 3 round burst weapon. While its DPS is lower than the other rifle class weapons, it is good for precise players. Additionally its higher than average reserve ammo makes it a good choice for the long run.

Handguns

The 1911 is the starting gun, it is bad.

The M-9 is a cheap gun that does reasonable damage per bullet. It can do great amounts of damage for players with a quick trigger finger, all while maintaining good accuracy.

The CZ75 is an impressive pistol that has a full-auto fire rate. While it is no match for a Rifle or SMG, this is a good choice for early game, given its price.

The Magnum is a revolver that behaves more like a shotgun than a pistol when it comes to damage. The main difference is that this gun has far more accuracy.

Shotguns

The Double Barrel Shotgun is an extremely powerful gun that is limited by a low clip size and a slow reload time. This makes it dangerous to use when pursued by a large amount of enemies.

The Pump Action and SPAS-12 shotguns are similarly powerful, but the pump action is limited by its fire rate. This makes the SPAS-12 more useful on average, but both guns are limited by their per-bullet reload method.

The AA-12 is a full-auto shotgun that has an amazing theoretical damage output, but it is difficult to handle as it has the highest recoil/lowest accuracy of any gun.

Submachine Guns

These guns are collectively quite similar to one another. Overall these guns are meant to compliment a Shotgun or Rifle, or stand on their own in early game.

The UZI has high damage and a fast fire rate accompanied by high recoil which makes it an acquired taste for players.

The MP5 and UMP have reasonable DPS with good ammo amounts. These guns are reliable, but not too special.

The MP40 is slower when it comes to fire rate, and has a slightly lower DPS as a result. This gun redeems itself by having the largest ammo reserve of any gun in the game. This makes it useful for the long run, but the lower than average DPS may make the other guns more appealing to players.

8.3 Formulas

All guns are balanced independently, not relying on any set formula other than how certain stats compare to that on other guns (fruity). The only stat that is derived from a formula is DPS, which is a simple product of the gun's damage (per bullet) and its fire rate (bullets/second).

Value/Cost is pretty arbitrary, this is something that will need to be tweaked and balanced during implementation. While not all guns are equal, especially when it comes to DPS, certain use cases and player perks make it so no one gun is necessarily better than another. Because of this certain guns that are inherently more accessible cost more, while others that have more specific use cases are slightly cheaper.

9.0 Internal Economy

9.1 Overview

The primary source of the player's income will come from shooting and killing zombies. Hit points make \$10 a piece, and kills reward \$100. Aside from this, players will be able to make money through gathering supplies (Medical, Food, and Scrap) and Research Samples (Contagion, Engineering). Supplies are sold to merchants at the Outpost for lump sums of cash, while also helping developing their respective merchant's industry - which gives the player more quests. Research samples also are sold for lump sums of cash, while also contributing to the side that the player has chosen to support (Fight for the Cure or Fight for the Extinction).

The player's money will primarily be used for buying ammo, weapons, and upgrades from merchant's stores, as well as in-level vending machines. Ammo, weapons, and upgrades can be bought, but not sold. It is also planned that the player's income will be spent on a cosmetic customization system, that is yet to be designed.

9.2 Tables

Name	Type	Sources	Value	Sellable	Description
AR-15 Ammo	Ammo	Stores, Vending, Drops	\$1,100	No	Replenishes AR-15 Ammo
AK-47 Ammo	Ammo	Stores, Vending, Drops	\$1,250	No	Replenishes AK-47 Ammo
M-14 Ammo	Ammo	Stores, Vending, Drops	\$900	No	Replenishes M-14 Ammo
M-16 Ammo	Ammo	Stores, Vending, Drops	\$1,050	No	Replenishes M-16 Ammo
1911 Ammo	Ammo	Drops	\$0	No	Replenishes 1911 Ammo
M-9 Ammo	Ammo	Stores, Vending, Drops	\$375	No	Replenishes M-9 Ammo
CZ75 Ammo	Ammo	Stores, Vending, Drops	\$700	No	Replenishes CZ75 Ammo
Magnum Ammo	Ammo	Stores, Vending, Drops	\$800	No	Replenishes Magnum Ammo
Double Barrel Ammo	Ammo	Stores, Vending, Drops	\$650	No	Replenishes Double Barrel Ammo
Pump Action Ammo	Ammo	Stores, Vending, Drops	\$750	No	Replenishes Pump Action Ammo
SPAS-12 Ammo	Ammo	Stores, Vending, Drops	\$950	No	Replenishes SPAS-12 Ammo
AA-12 Ammo	Ammo	Stores, Vending, Drops	\$1,050	No	Replenishes AA-12 Ammo
UZI Ammo	Ammo	Stores, Vending, Drops	\$800	No	Replenishes UZI Ammo
MP5 Ammo	Ammo	Stores, Vending, Drops	\$900	No	Replenishes MP5 Ammo

UMP Ammo	Ammo	Stores, Vending, Drops	\$900	No	Replenishes UMP Ammo
MP40 Ammo	Ammo	Stores, Vending, Drops	\$1,000	No	Replenishes MP40 Ammo
Medical Supplies	Supplies	Drops, Environment	\$5,000	Yes	Replenishes Medical Supplies
Food Supplies	Supplies	Drops, Environment	\$5,000	Yes	Replenishes Food Supplies
Scrap Supplies	Supplies	Drops, Environment	\$5,000	Yes	Replenishes Scrap Supplies
Contagion Sample	Research	Drops	\$10,000	Yes	Replenishes Contagion Sample
Engineering Sample	Research	Drops	\$10,000	Yes	Replenishes Engineering Sample

10.0 Inventory System

10.1 Overview

Inventory is a relatively limited feature within this game. While there is a UI screen present, its purpose is not for the player to interact with it, but to see their loadout and other mission-relevant items. A version of this UI will be available when players are out of a mission, and the player can edit their base loadout for going into levels.

On the inventory screen, the focal point is an isolated 3D model of the player's character in its present state. Boxes featuring icons of the player's current loadout are on either side of the player's model, with lines drawn to call out where these items are located on the player.

The average, base player will be able to carry (or otherwise display) the following:

- 2 main weapons (potentially more, given the class & perks)
- 1 melee weapon
- 4 grenades
- 1 ability
- 1 backpack
 - Key mission items will be stored here
 - Key story items will be stored here
- Any active perks

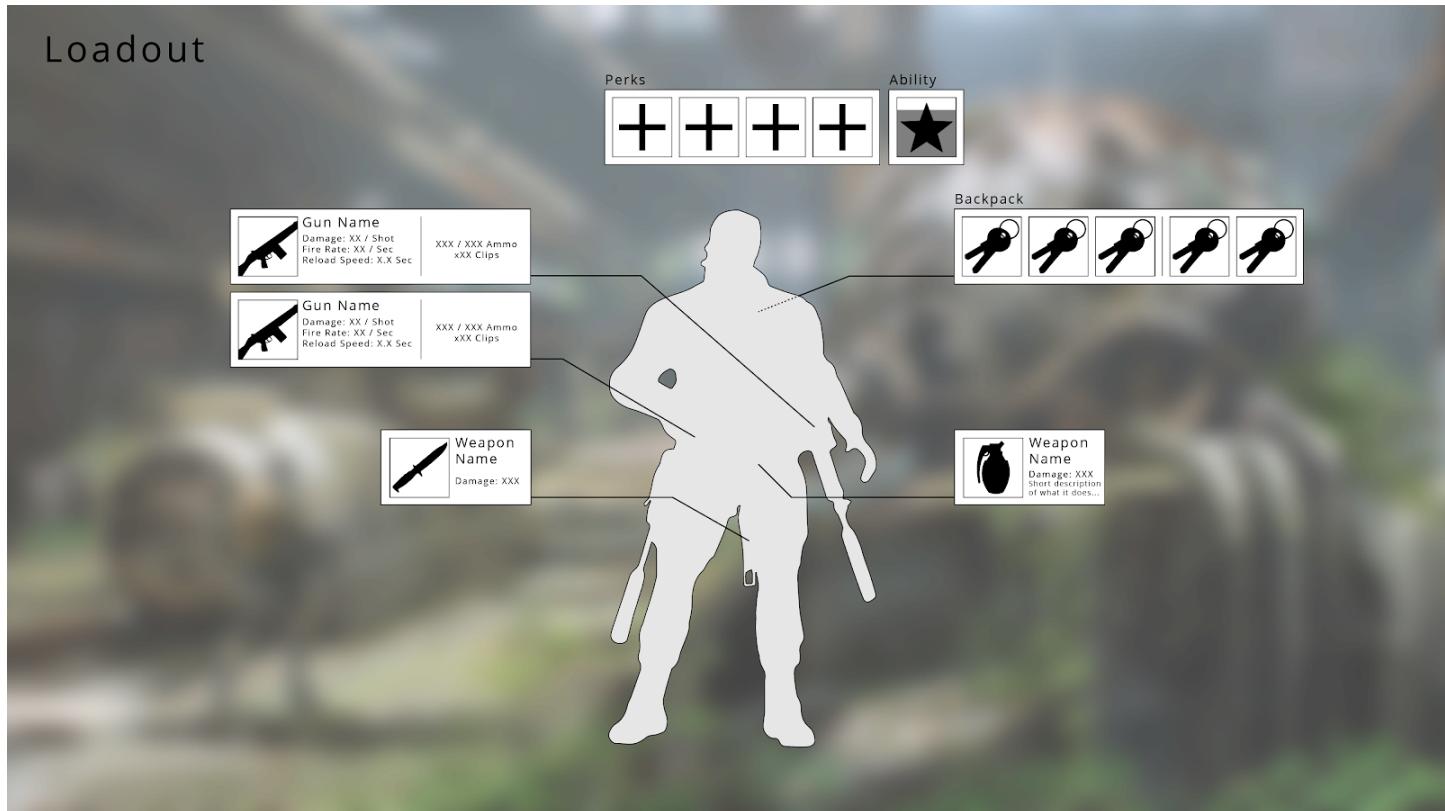
If out of a mission, clicking on any one of these items will open up a side menu to select a different option, if any are available. Inventory management during a mission is facilitated through an intractable system and swapping by interacting.

10.2 UI

- Primary & Secondary Weapon
 - Displays an image of the weapon, as well as clip and reserve ammo. Basic weapon stats are displayed.
- Melee Weapon
 - Displays an image of the weapon, and the damage it does

- Grenades
 - Displays icon of grenade type, with a short description of what the grenade does.
- Ability
 - Displays ability icon and recharge state (if recharging). Hovering over an icon will show a description.
- Backpack
 - Displays a list of backpack items, showing their icon. Hovering over an icon will show a description.
- Active Perks
 - Shows perk icons. Hovering over an icon will show a description.

Mock-Ups





11.0 Probability

11.1 Item Drops

Because the player will be receiving \$\$ with every bullet hit and kill, item drops do not occur with every kill. Each enemy type has a **% Base** drop rate that influences how often upon being killed does an item drop occur. Then, each of the 12 items that can be dropped have an associated **% Modifier** as well, which influences how often when a drop does occur, that particular item is the resulting dropped item. This results in a **% Total** of the drop of that item occurring, by multiplying the base rate with the modifier.

Beyond the rates associate with these items, there are two types of drops:

- Power-Up - These are short (~30s) gameplay modifiers that have more extreme impact than the more common perks that players receive.
 - Example: Double XP gives the player 2x the experience points gained across the board for 30s, then reverts to normal.
- Pick-Up - These are non timed items that usually impact the player's inventory or status in an immediate fashion.
 - Example: Max Ammo immediately increases the players ammo reserves (gun, grenades, etc) to its max capacity upon interaction.

Item Name	Type

Double \$\$	Power-Up
Extra \$\$	Pick-Up
Double XP	Power-Up
Extra XP	Pick-Up
Unlimited Ammo	Power-Up
Max Ammo	Pick-Up
Half Price	Power-Up
Insta-Kill	Power-Up
Random Perk	Pick-Up
Contagion Sample	Pick-Up
Engineering Sample	Pick-Up
Supplies	Pick-Up

Tables

Standard Zombie

% Base	Item Name	% Modifier	% Total	% Base	Item Name	% Modifier	% Total
2.50%	Double \$\$	10.00%	0.25%	5.00%	Double \$\$	10.00%	0.50%
	Extra \$\$	12.50%	0.31%		Extra \$\$	12.50%	0.63%
	Double XP	10.00%	0.25%		Double XP	10.00%	0.50%
	Extra XP	12.50%	0.31%		Extra XP	12.50%	0.63%
	Unlimited Ammo	10.00%	0.25%		Unlimited Ammo	10.00%	0.50%
	Max Ammo	10.00%	0.25%		Max Ammo	10.00%	0.50%
	Half Price	5.00%	0.13%		Half Price	5.00%	0.25%
	Insta-Kill	10.00%	0.25%		Insta-Kill	10.00%	0.50%
	Random Perk	5.00%	0.13%		Random Perk	5.00%	0.25%
	Contagion Sample	0.00%	0.00%		Contagion Sample	2.50%	0.13%
	Engineering Sample	0.00%	0.00%		Engineering Sample	2.50%	0.13%
	Supplies	15.00%	0.38%		Supplies	10.00%	0.50%

Armored Zombie

% Base	Item Name	% Modifier	% Total	% Base	Item Name	% Modifier	% Total
25.00%	Double \$\$	10.00%	2.50%	75.00%	Double \$\$	7.50%	5.63%
	Extra \$\$	5.00%	1.25%		Extra \$\$	0.00%	0.00%
	Double XP	10.00%	2.50%		Double XP	7.50%	5.63%
	Extra XP	5.00%	1.25%		Extra XP	0.00%	0.00%

	Unlimited Ammo	5.00%	1.25%		Unlimited Ammo	0.00%	0.00%
	Max Ammo	12.50%	3.13%		Max Ammo	10.00%	7.50%
	Half Price	10.00%	2.50%		Half Price	10.00%	7.50%
	Insta-Kill	7.50%	1.88%		Insta-Kill	0.00%	0.00%
	Random Perk	10.00%	2.50%		Random Perk	15.00%	11.25%
	Contagion Sample	12.50%	3.13%		Contagion Sample	25.00%	18.75%
	Engineering Sample	12.50%	3.13%		Engineering Sample	25.00%	18.75%
	Supplies	0.00%	0.00%		Supplies	0.00%	0.00%