**Game Design Document**

Game Title: Reverse Frogger  
Game platform: PC, Android  
Target Age: 1 - 12  
Rating:

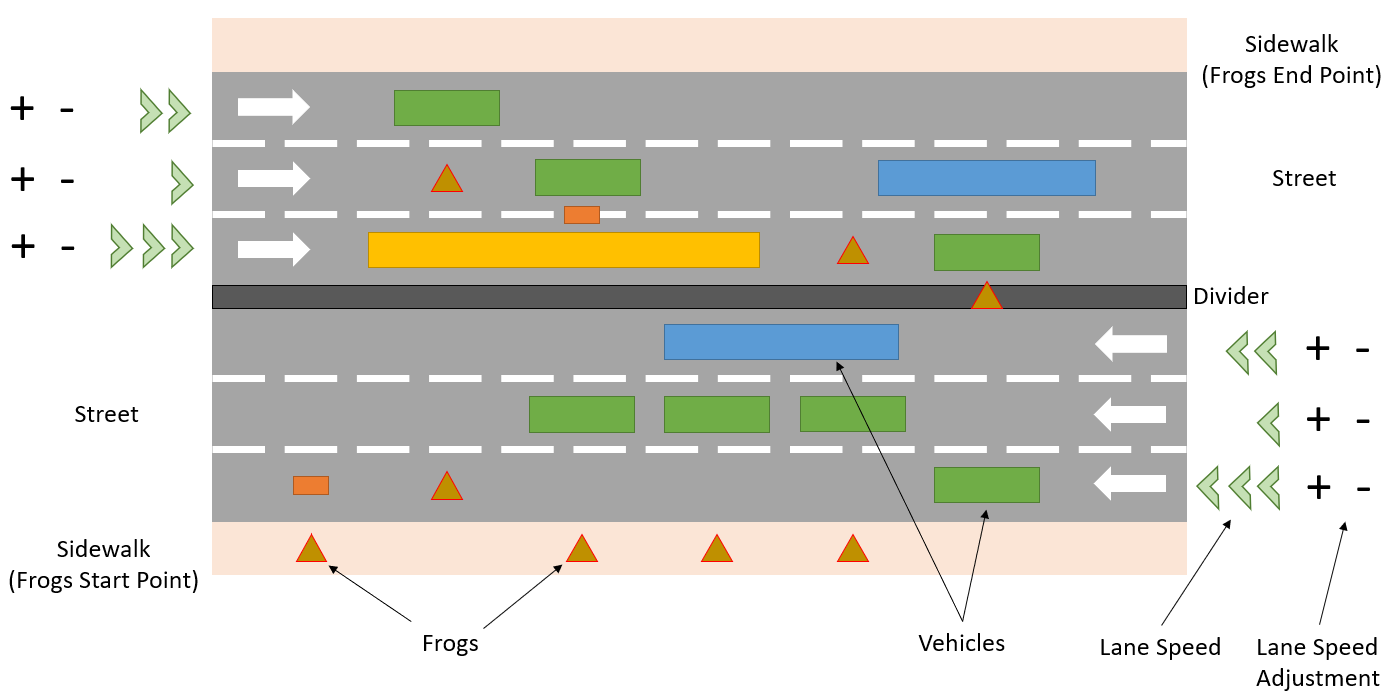
Game Summary: Direct flow of traffic to prevent any frogs from crossing the road! Then reverse the roles, and lead the frogs to victory.

Game Outline: Frogs are trying to cross the road again and this time, they come better prepared than before. They have trained and upgraded themselves in different combat and defense capabilities, and are employing advanced strategies to cross the road tactically. We do not want to induce panic among the humans so we have to deal with the frogs naturally, and that is using the morning rush-hour traffic on the road. By influencing the flow of traffic, we will put a stop to the frogs’ advances! We as humans must not let them cross it, or else…

Unique Selling Points:  
- A twist on the classic Frogger game  
- Plan the moves to stop the frog army advances by directing traffic, calling in vehicles, speeding up / slowing down lanes   
- Flip the switch, become the frog leader and overcome the human’s plan (your own plan!)  
- Play a variety of game modes: puzzle mode, endless mode, PvP  
- Play it turn-based, or in real-time

Similar Competitive Products: Frogger

**Map**



Map is broken into a 11x9 grid (basic). The frogs will only spawn in the middle 7 grids from the south sidewalk, with 2 additional grids on left and right for a buffer, showing new vehicles entering the playable area.

Game grid can be extended as required, more lanes (vertically) or more horizontal coverage.

**UI**:

Turn number, HP bar, wave number, remaining enemies

Lane adjustment controls ( + / - )  
Lane speed green arrows showing current speed

Skill gauge - using circles/orbs to indicate skill points  
Skills bar - buttons for skill - 6 skills

Finish turn button

When selecting a frog, or a vehicle, a pop up UI shows additional details of that frog/vehicle.   
Each skill will have its own UI interaction supporting it. Frogs/vehicles will be highlighted if the skill can be executed on it.   
Have additional UI to indicate “skill about to happen next”

**Enemy Types** (V itw: Vehicle in the way)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Name** | **Movement Pattern** | **Additional** | **Interval** | **Resist** | **HP** | **DMG** |
| Soldier  (Green O) | Forward 1 step | V itw: remain on spot, and skip 1 turn (concussed) | 1 turn | - | 1 | 1 |
| Brute  (Dark Red O) | Forward 1 step | V itw: knock the car forward if there is another lane and step forward. If the next lane is a divider/sidewalk, hold position. | 1 turn | Takes 1 HP damage if hit by vehicle and stops vehicle | 2 | 4 |
| Skater  (Yellow O) | Diagonal left then diagonal right then repeat | V itw: move to horizontal displacement but no vertical displacement | 1 turn | - | 1 | 1 |
| Sprinter  (Red O) | Forward 2 step | V itw: remain on spot, and skip 2 turn  (concussed) | 1 turn | - | 1 | 1 |
| Charger  (Orange O) | Forward continually until it hits a veh or half the map | Winds up for the charge over 3 turns.  V itw: stop at spot before, and skip 1 turn (concussed) | 3 turns | - | 1 | 2 |
| Jumper  (Purple O) | Forward 1 step | V itw: jumps on top of the veh in front. Will ride the veh while on top. | 1 turn | - | 1 | 1 |
| Vaulter  (Light Purple O with stick) | Forward 1 step | Holds a vault pole that extends 1 lane behind. If any veh hits the vault pole, it will stun the vaulter (skip 1 turn) and disable him, turning him into a “grunt”.  V itw: vaults over to the next lane after. | 1 turn | - | 1 | 1 |
| Baby  Foresight  (Grey O) | Forward/Left/Right 1 step | V itw: move behind the vehicle path if no V itw, else stay.  If no V itw but veh on left/right, stay. | 1 turn | - | 1 | 1 |
| Shield (L/R)  (Green O with shield) | Forward 1 step | V itw: remain on spot, and skip 1 turn (concussed) | 1 turn | All vehicles approaching from the shield side will be stopped in its tracks (even while concussed), until the frog leaves. | 1 | 2 |
| Bloat  (Black O) | Forward 1 step | V itw: remain on spot, and skip 1 turn (concussed) | 1 turn | When killed, explode bile onto colliding veh, stopping veh and remain for 1/2 turn | 1 | 2 |
| Flatten  (Rectangle) | Forward 1 step | V itw: flattens body and moves under. Un-flatten if possible. | 1 turn | While flatten, resist all veh except motorbike | 1 | 1 |

**Vehicle Types** (all veh will follow lane direction, speed is capped by max(max spd, lane spd))

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Movement | Additional | Size | Max Spd |
| Car | - | Manual lane change possible  Can be displaced by brute | 1L | 3 |
| Speedy Car | - | Manual lane change possible  Can be displaced by brute | 1L | 4 |
| Truck | - | Manual lane change possible  CANNOT be displaced | 2L | 2 |
| Bus | - | Manual lane change possible  CANNOT be displaced | 3L | 1 |
| Motorbike | - | Ride in the middle of lane, but if there is a veh in front (either disabled or moving slower), it will shift to ride in between lanes and continue its progress.  Manual lane change possible  Can be displaced by brute | 1L | 3 |
| Race Car (Reckless) | Lane speed + 2spd | Auto lane change and continue progress. If unable to lane change, stop progress  No manual lane change | 1L | 5 |
| Garbage Truck | - | Emits smelly air 1 grid behind it, stuns all enemies that are in smelly air.  Manual lane change possible | 2L | 1 |
| Road Sweeper | - | Only on lanes adjacent to sidewalk / divider.  No manual lane change | 1L | 1 |

Note:  
Motorbikes will shift in-between lanes if vehicle is in its path. It will shift up in-between, from bottom to up, until the topmost lane, where it will shift down instead.

**Player Control**

Lane Speed Control  
Every lane has a speed adjustment control with 1, 2, 3 speed. Every turn, it can be increased or decreased by 1 speed point. All lanes can be adjusted in speed simultaneously in the same turn. Vehicles will react to the new speed immediately on the turn it is applied.  
(i.e. Speed adjustment is applied to the lane, then the vehicles move based on the new speed)

Player Skills  
Skill Gauge:   
Contains skill points earned over the course of the game that can be spent on skills.  
- After each frog kill, the player will gain 1 skill point.  
- On standard mode, every turn will grant the player 1 skill point

Skills:  
1. Snipe (8 pts) [818BFF]: immediately snipes the frog. Dealing 1 HP in damage (exceptions: cannot hit frogs on top of vehicles, or is “flattened” and hidden under a vehicle)  
2. Call-in Vehicle (3pts) [24EDF5]: calls in a chosen vehicle that arrives at the start of a lane on the following turn. Cannot call in on a lane that is awaiting the called in vehicle  
3. Air-drop Vehicle (10 pts) [66FF9B]: air drops a chosen vehicle right onto an empty grid on the lanes. Will kill any unit below it.   
4. Manual Lane Change (2pts) [FAA256]: perform a manual lane change to a vehicle, if possible (exceptions: cannot lane change onto divider, or sidewalk, or into another vehicle, or into an enemy)  
5. Boost Unit (3pts) [FF8888]: give the unit an extra turn   
6. Disable Unit (3pts) [FF94EC]: stun a unit for a turn

**Environment**

Night-time  
Limited vision on road. Only light sources are sidewalk lamps (full vision on sidewalks), and headlights from vehicles (light up 2 grids away). No light on the divider. No light on top of vehicles.

#### 

**Sprites / Textures / Particle Effects / Sound Effects**

|  |  |  |
| --- | --- | --- |
| **Group** | **Object** | **Sprite** |
| Enemies | Soldier | Slime |
| Brute | Minotaur |
| Skater | Crab |
| Sprinter | Ghoul |
| Charger | Cyclops |
| Jumper | Imp |
| Vaulter | Akaname |
| Foresight | Intellect Devourer |
| Shield (L/R) | Fishfolk |
| Bloat | Brain Mole |
| Flatten | Ice Elemental |
| Vehicles | Car |  |
| Speedy Car |  |
| Truck |  |
| Bus |  |
| Motorbike |  |
| Environment | Road |  |
| Sidewalk |  |
| Divider |  |
| Background |  |
| Cloud (sides) |  |

**Particle Effects**

|  |  |  |
| --- | --- | --- |
| **Action** | **Particle** | **Y/N** |
| Vehicle Moving |  |  |
| Vehicle Stunned (by player action) | lightning paralyse effect on unit |  |
| Vehicle stunned by bloat |  |  |
| Vehicle blocked by shield |  |  |
| Vehicle hit by brute |  |  |
| Vehicle Moving Faster |  |  |
| Vehicle entering bubble |  |  |
| Vehicle airdrop in |  |  |
| Vehicle hit enemy |  |  |
| Vehicle hit brute first time |  |  |
| Bloat exploding |  |  |
| Enemy stunned by player action | lightning paralyse effect on unit |  |
| Enemy concussed by running into vehicle |  |  |
| Disable Unit player skill | Lightning strike effect, lightning paralyse effect on unit |  |
| Boost Unit player skill | Yellow glow effect on unit |  |
| Lane Change player skill | Exclamation mark on unit |  |
| Assassinate enemy player skill | Slash effect and skull on unit |  |
| Airdrop player skill | Parachute on vehicle  Landing effect |  |

**Attribution of Media**

|  |  |  |  |
| --- | --- | --- | --- |
| BGM | Day 0 Music | https://marksparling.ca/ |  |
| Vehicle & Backgrd |  | https://nyknck.itch.io/citypackpixelart |  |
| Clouds |  | https://latenightcoffe.itch.io/2d-pixel-art-semi-realistic-clouds |  |
| Vehicle & Backgrd |  | https://emily2.itch.io/modern-city | CC0 |
| Monster |  | https://elthen.itch.io/ | CC BY-NC 4.0 |
| UI |  | https://sungraphica.itch.io/sci-fi-game-ui-collection-free-version |  |
| UI Icons |  | https://icons8.com |  |
| Spell Effects and Explosion |  | https://free-game-assets.itch.io/11-free-pixel-art-explosion-sprites |  |
|  |  |  |  |
| Call in Vehicle dialogue | Super Dialogue Audio Pack | https://www.dillonbecker.com/ | CC BY 4.0 |
| UI Button Selection sounds | Universal UI/Menu Soundpack | https://ellr.itch.io/universal-ui-soundpack | CC BY 4.0 |
| Invalid UI selection and Retro ringtone | 200 Free SFX | https://kronbits.itch.io/freesfx | CC0 |
| Abaddon Font | Abaddon Font | https://caffinate.itch.io/abaddon | CC BY 3.0 |
| UI selection, deselection and confirm sounds | Interface SFX Pack 1 | https://obsydianx.itch.io/interface-sfx-pack-1 | CC0 |
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**- Vehicles, City and Background Sprites: "City Pack - Top Down - Pixel Art" pack (https://nyknck.itch.io/citypackpixelart) by @nyk\_nck.**

**- Bus Sprite: "Modern City Top-Down Tileset" by Exuin (https://emily2.itch.io/), licensed under CC0.**

**- Clouds: "Pixel Art Semi-Realistic Clouds" by LateNightCoffee (https://latenightcoffe.itch.io/).**

**- All Monster Sprites: By @pixelthen (https://elthen.itch.io/), licensed under CC BY-NC 4.0.**

**- Spell Effects and Explosion: "Free Pixel Art Explosions" by @craftpix\_net (https://free-game-assets.itch.io/). License for use of free products at https://craftpix.net/file-licenses/.**

**- Background Music: Slowed down version of "70 days of Music - Day 1" by Mark Sparling (https://marksparling.ca/), licensed under CC.**

**- Call-in Vehicle Dialogue: "Super Dialogue Audio Pack" by Dillon Becker (https://www.dillonbecker.com/), licensed under CC BY 4.0.**

**- UI Button Selection Sound: "Universal UI/Menu Soundpack" by Ellr (https://ellr.itch.io/universal-ui-soundpack), licensed under CC BY 4.0.**

**- Invalid UI Selection and Retro Ringtone: "200 Free SFX" (https://kronbits.itch.io/freesfx) by @DavitMasia, licensed under CC0.**

**- UI Selection, Cancel and Confirm Sounds: "Interface SFX Pack 1" (https://obsydianx.itch.io/interface-sfx-pack-1) by ObsydianX (https://obsydianx.itch.io/), licensed under CC0.**

**- Game Font: "Abaddon Font" (https://caffinate.itch.io/abaddon) by Nathan Scott (@caffi\_nate), licensed under CC BY 3.0.**

**- UI Windows, Buttons and Icons: "Sci Fi Game UI collection FREE version" by Sungraphica (https://sungraphica.itch.io/).**

**- UI Icons: By Icons8 (https://icons8.com)**

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**To-do**

|  |  |
| --- | --- |
| **Description** | **Done** |
| Call-in vehicle and air drop vehicle  Setup:   * VehicleSpawner class handles spawning in the staging vehicles for calling in or air dropping vehicles. Spawn one of each and hold in a list. * Clicking button opens a UI to select the car * Set selected\_skill to call-in/airdrop * The UI is a full panel that is non-clickthrough, with the 3x2 buttons on it, and it has a X button at top-right. * User can exit the UI by clicking X button, clicking outside the panel, clicking the call-in / air-drop button again. Exiting UI will drop skill from selected\_skill. * When the car button is clicked, grab the unit referenced from the spawning class and create the Skill. Save the skill in tmp holder. * The usercontrol will now be in location selector state. This will generate red boxes or green boxes when moused-over spots to drop the vehicle. Red boxes will indicate unable to drop and when clicked, will not have any reaction. Green boxes are ok to drop and when clicked, it will translate the click pos to gridcoords and add to the skill. This will then trigger the skill button highlight and save to the dictionary. * Call-in vehicle lane validity is based on whether there is any existing called-in vehicle for that lane that has not appeared. It will replace the vehicle in that spot if the vehicle has not moved into view. I.e. called-in immediately. If not, it will follow directly behind vehicles like truck/bus. * Air-drop vehicle grid validity have to check for its entire vehicle length whether dropping in is possible, with no other vehicle in the way. Dropping in will kill any mobs. * The CallInVeh and AirDropVeh classes that implements Iskill will execute the shifting of the unit to the targeted location, rotate as necessary, and set the move direction. |  |
| Skill Orbs   * Generation and display. Display yellow squares based on grid, to a max of 10. * Each turn generates 1 orb. Each kill generates 1 orb. |  |
| Skill Buttons   * The buttons will become disabled if there is insufficient orb available. It will turn grey and be unclickable. * On begin of player’s turn, trigger a re-check on the buttons. * When a skill is selected, reduce orb by making them grey. Do not trigger re-check. * When a skill is highlighted, keep the grey orbs and trigger a re-check on the buttons for other skills. * When cancelling a skill, turn the grey orbs to yellow and trigger re-check. * Don’t disable a button due to lack of skill orbs if it has been highlighted. |  |
| Health Orbs   * Start with 10 health. Each enemy that reaches the end reduces health based on damage |  |
| Add a game log box to keep track of logged interactions in the game, used for dev now and will be refined for player in future.  Player can see their past actions and receive feedback on their actions. |  |
| After skill is targeted onto the unit, add an indication to show that unit is targeted by what skill |  |
| Skill Info button – click to bring up a full panel UI (non-clickthru) that describes each skill. Button is a small “?” button at top left of skill bar panel |  |
| Airdrop vehicle – make it such that it always ignores incoming vehicles in that lane. I.e. it will overlap vehicles, but is unseen. It will block call-in vehicles too, if it is a bus. |  |
| Add level number and kills number info on UI |  |
| Call-in vehicle – if there is a vehicle on the spawn spot, if that vehicle has not entered the playable area, it should replace the vehicle. I.e. remove the spawned vehicle and replace with the called in vehicle. |  |
| Right Clicking will exit any InfoPopup selection, and any skill selection, or skill targetting, and locator mode. |  |
| Indication of Enemy killed after a round – when enemy dies, it leaves behind a UI indicator that is of lowest hierarchy on the canvas. Indicator is a small skull icon. It will remain through the player’s next turn and will then be destroyed upon ending turn, thus it shows enemies killed in the previous round. |  |
| Indicator to show what phase it is in – Enemy, Vehicle, Player, Skill |  |
| Endless – easy, medium, hard. No more Standard mode.  Easy = slower start with easier mobs (level 1, 2mobs)  Medium = accelerated start with tougher mobs (level 10, 2mobs)  Hard = accelerated start with more tougher mobs (level 10, 3mobs, veh can destroy) |  |
| Brute to take pre-turn action of checking and knockbacking vehicle in front of it. All other enemy will act on the post brute action.  Brute should not be able to knockback onto another brute, unless said brute is 1 HP |  |
| Multiple new enemies at same time, should show all new enemies and not overwrite |  |
| To readjust all enemy collider to fit its sprite |  |

**ToDo Part2**

|  |  |
| --- | --- |
| **Description** | **Done** |
| Display of skill markers for multiple actions issued onto the same unit, it overlaps uglily. Unit will hold a count for number of skills assigned to it. SkillManager uses this to position the icon on target  When a skill is untargeted, usercontrol calls all skill manager 1 by 1 to recheck and reposition icon on target. |  |
| Skill markers to be green instead of yellow |  |
| Make skills trigger 1 by 1 with delay so the effect can be processed by the player, and not all happening at the same time |  |
| Sniping enemy does not leave a killed indicator and does not add skill orbs and does not add to a kill count. Enemy should have its own destroy self, that does what is done when collided. |  |
| Skill buttons should all be disabled in between player turns. Prevent player from using skill before his turn. |  |
| Positioning of units when atop vehicles. Influenced by yAdjustment.  When multiple units on top, do a very small spread within max left and right (max left and right determined by vehicle name (and spread only depends on number of units with yAdjustment = 3) i.e. doesn’t affect flatten. Normal adjustment still apply for units below. I.e. 3 units on top will spread left to right within max left and right, and 2 flatten below should spread as per normal spread. |  |
| Experiment with brightening all enemy sprites to improve visibility |  |
| Add visual effects for sniping, for boosting and for disabling |  |
| Bloat added death explode poison cloud effect, that covers 1 grid in radius.  Updated effect of bloat, that stuns all vehicles within 1 grid radius for 1 turn |  |
| Vehicle airdrop animation to play it dropping from top of the screen |  |
| Indication of damage taken after an enemy round  Add simple pulsing red |  |
| Hard mode – to make vehicles destroyable  Bus: 5 HP, Truck: 4HP, Cars: 3HP |  |
| If is no knockback spots for brute, like divider and sidewalk next, still do brute animation, do vehicle slight motion to simulate getting hit, and deal damage to vehicle for hard mode |  |
| When vehicle hit brute, deal damage to self as well |  |
| Difficulty explanations on menu. Difficulty indicator ingame. Highscore linked to difficulty in dictionary |  |
| Add BGM |  |
| Add sound effects for skills happening |  |
| For medium and hard, do a faster leveling up, instead of instantly into advanced mobs. Level up per wave until level 10. Or 1 wave for each levelup until 5, then 2 wave for each levelup until 10. |  |
| Add mini blips for skill selection, and skill targeting, and fail selection. |  |
| Add stop music button. Add mute all button. Remove game log button and gamelog window. Add instructions button and instruction window. |  |
| Call in sound for vehicle call in. |  |
| Need vehicle sounds. Lane Change. And Moving. |  |
| Need indication of stunned vehicles and stunned units.  Implementation is to set stunned animation as idle motion, and set tint to darker grey |  |
| Stunned animation for Flatten and Shield. |  |
| Gameover music and fix best score saving and loading |  |
|  |  |
|  |  |

**Fixed airdrop animation that is sometimes delayed. Fixed stunned interaction when airdropped onto bloat.**

**Add Car Selection UI Sound**

**Done stunned animation for flatten and shield**

**Bugs**

|  |  |  |
| --- | --- | --- |
| **Description** |  | **Scheduled** |
| When vehicle explodes, units on top of it are still floating. They should drop down to yadjustment 0 |  |  |
| Knockback from brute did not move units on top of vehicle |  |  |
|  |  |  |
|  |  |  |
| Monsters still get pushed before dying |  |  |
| Reduce brute hit enemy sound |  |  |
| If enemy goes out of bounds, destroy them as well, but no orbs? |  |  |
|  |  |  |
|  |  |  |

**What Ifs**

**Fixed Bugs**

Lane Change selection allows to select a truck/bus on its tail grids. It should direct the selection to the head of vehicle.

Lane Change checking of feasibility does not account for multiple grid vehicle, such as truck and buses

Lane Change for vehicles does not account for motorcycle in the way when motorcycle is in-between lanes

Lane Change should not be allowed when vehicle is stunned

Lane Change – clicking lane change button again to deselect it did not remove lane change UI

Enemy Spawn should trigger grid repositioning too

Lane Change - Selecting motorbike in-between lane will not centre the UI on it, it centres onto the grid instead.

Skater vehicle in the way issue – when vehicle is diagonally, it will hit and displace horizontally instead, but there might be a vehicle horizontally. How to resolve? KEEP AS IT IS. Skater will displace horizontally and die

Positioning of enemies in a grid – there should be priority system for the positioning as brute and shield will block vehicles and should be against the direction of traffic. With shield as priority, followed by brute. Shield will defend brute from taking damage.

Double Brute acting on the same vehicle will knock it back twice. It should only knock once.

**Delayed Features**

Motorbikes weaving in-between lanes – and all the interactions that will come from it.  
Bugs:

* Motorbike when in-between lanes, moves back into the lane, instead of remaining in-between lane while another vehicle is in its place
* Motorbike changing lane – issue when the motorbike that is in-between lane is the one that is disabled while the one in the middle wants to change lane
* Jumper interaction and vaulter interaction with motorbikes. If it is on top of the motorbike and it shifts in-between lanes. Might need to stick the object to the top of vehicle.
* Multiple jumpers/vaulters on a motorbike – repositioning how?