Simple Traffic System
V 1.0.6

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Please consider leaving a review to let me know how I'm doing, it means a lot to me.

The asset is still being improved, if you have any feedback please join the discussion forum:
https://forum.unity.com/threads/simple-traffic-system.794268/

Introduction

Simple Traffic System is an easy to use traffic system with editor helper tools that allow for quick creation of waypoint based routes that can be interconnected to create complex road networks in your scenes. The primary logic is highly optimized using the new C# Job System and Burst Compiler, allowing you to use more of your performance budget for other content.

AI traffic logic is handled by a single **AI Traffic Controller** that **AI Traffic Cars** register to. This is a data oriented logic structure and allows the AI logic to run in parallel jobs spread across all available cores to reduce CPU usage on the main thread.

Project Setup

This package uses the new C# Job System and Burst Compiler. You must make the following project configurations to enable these Unity features.

Player Settings

-Open the Player Settings (Edit > Project Settings > Player).
-Scripting Runtime Version .Net 4.x Equivalent
-API Compatibility Level .Net 4.x

Package Manager Dependencies

-Open the Package Manager (Window > Package Manager), enable Show Preview Packages.
-Burst
-Collections
-Jobs
-Mathematics

Job Settings

-Enable "Jobs > Burst > Enable Compilation" from the Unity menu bar.

Standalone Builds

To use the burst compiler in standalone builds, you need to install the Windows SDK and VC++ toolkit from the Visual Studio Installer.

Instructions

Many prefabs can be added to the scene from the toolbar menu:
Tools > Simple Traffic System

To begin, add an **AI Traffic Controller** to the scene, add an **AI Traffic Waypoint Route** to the scene, add **AI Traffic Waypoints** to the route, and assign an **AI Traffic Car** prefab to the **Spawn Traffic Vehicles** array. This will provide your first route and a car to drive on it. Customize the **AI Traffic Waypoint** inspector settings to change how fast the car is allowed to drive after reaching each point to make the car speed up or slow down.

This documentation will explain where the required objects are located and details about how they are used. A list of tutorial videos is also available to explain in greater detail and provide a visual demonstration of how to use the systems in this package.

AI Traffic Car
The base car prefab used by the traffic system. Duplicate this prefab and replace the mesh with your own to create new vehicles. The prefab is located at: **Assets\TurnTheGameOn\SimpleTrafficSystem\Prefabs**

AI Traffic Controller
This is the primary logic controller for AI cars. There must be only one in the scene (it's a singleton) for AI cars to register to. Add it to a scene by selecting **Tools > Simple Traffic System > AI Traffic Controller**. The prefab is located at: **Assets\TurnTheGameOn\SimpleTrafficSystem\Resources\AITrafficController**

AI Traffic Waypoint Route
These are the core building blocks used to create road networks. The demo scene has about 100 interconnected AI Traffic Waypoint Routes. Add it to a scene by selecting **Tools > Simple Traffic System > AI Traffic Waypoint Route** or pressing **Ctrl + Alt + R**. The prefab is located at:
Assets\TurnTheGameOn\SimpleTrafficSystem\Resources\AITrafficWaypointRoute

AI Traffic Waypoint
These are used and spawned by **AI Traffic Waypoint Routes** by pressing **Alt + Left Click** in the scene view on a collider. Set the speed limit for each point to control how fast you want traffic to travel. Interconnect routes by assigning the **New Route Point** array index on the final waypoint of a route to the first waypoint of another route. The prefab is located at: **Assets\TurnTheGameOn\SimpleTrafficSystem\Resources\AITrafficWaypoint**

AI Traffic Light Manager
These control groups of **AI Traffic Lights** by sequencing **Traffic Light Cycles** based on timers set for each sequence. Each Traffic light cycle holds an array of **Traffic Lights** which hold a reference to **AI Traffic Waypoint Routes**, once a route is assigned to a traffic light, the light will control if the car at the final waypoint is allowed to proceed through the intersection to the next connected waypoint route. Add it to a scene by selecting **Tools > Simple Traffic System > AI Traffic Light Manager** or pressing **Ctrl + Alt + L**. The prefab is located at: **Assets\TurnTheGameOn\SimpleTrafficSystem\Resources\AITrafficLightManager**

Editor Helper Tools

Some simple tools have been added to help automate and reduce some of the work that's required when configuring routes for larger road sections or networks. These tools will be improved in the next update to the asset, the goal is to move the windows to a single editor window and improve workflow where possible by reducing the need to manually configure settings. If you have any feedback please join the discussion forum and share.

Route Creator

This tool can generate multiple **AI Traffic Waypoint Routes** and their **Waypoints** along a spline. Add it to a scene by selecting **Tools > Simple Traffic System > Route Creator**.

Route Connector Window

Open from the Unity toolbar by selecting **Tools > Simple Traffic System > Route Connector Window**. Select **Load Routes** to load all routes from the scene into the editor. Use the scene view handle to select "From and To points", handle buttons are located above each waypoint. Press **Connect Route Points** to create a connection.

Signal Connector Window

Open from the Unity toolbar by selecting **Tools > Simple Traffic System > Signal Connector Window**. Select **Load Lights & Routes** to load all traffic lights and routes from the scene into the editor. Use the scene view handle to select "From Light and To Route points", handle buttons are located above the final route point and traffic signal. Press **Connect Light to Route** to assign a connection. This window is also useful to visually debug which traffic light signal is connected to which route.

Spawn Points Window

Used to configure spawn points for the traffic pooling system. Open from the Unity toolbar by selecting **Tools > Simple Traffic System > Spawn Points Window.** Select **Load Routes** to load all routes from the scene into the editor. Select **Align Route Waypoints** to have each waypoint's transform orientation set to face the next waypoint in the route. When routes are loaded, a scene handle button named **S** is placed above each waypoint in the scene. Press this button to load an **AITrafficSpawnPoint** into the scene as a child of that point.

Lane Connector Window

Used to connect waypoint routes for lane changing. Open from the Unity toolbar by selecting **Tools > Simple Traffic System > Lane Connector Window.** Select **Load Routes** to load all routes from the scene into the editor. Use the scene view handles to select 2 adjacent "Routes", handle buttons are located above the final route point. Press **Setup Lane Change Points** to create a connection.

Tutorial Videos

Video 1
Basic Workflow Demonstration: https://youtu.be/9joaeFUyM8o

Video 2
Route Connector Window: https://youtu.be/rt00hXpMy4k

Video 3
Route Creator: https://youtu.be/Z9lDWf5nWm4

Video 4
Signal Connector Window: https://youtu.be/Br3U3BSocYU

Video 5
Traffic Pooling System: https://youtu.be/X6SyOG6UhLs

Video 6
Lane Changing: https://youtu.be/S4510p1LgYU