Living Scenery Technology 1.11.1 Manual

By X-Codr Designs

1 – Overview

1.1 – Introduction

I'm proud to present, Living Scenery Technology! What is LST? LST is a global plugin that provides ground traffic, static object placement (for access to the particle system and X-Plane's 12 FMOD), and Dataref utilities.

LST supports **Windows, Linux (compiled and tested on Ubuntu), and Mac OS X, as well as X-Plane 11.x, 12.x, and future versions.**

LST is **fast**, a large airport like Denver costs only roughly an additional 5-10% of performance with very heavy vehicles, for most cases, there will be no hit.

LST is **Freeware and will remain that way forever**. This is a **developer manual** providing an overview of **LST's** features, file formats, and utilities (developer utilities are Windows only).

- **LST, Living Scenery Technology** is provided **free of charge**. That does **not** make **LST** public domain or free of copyright. You must still follow this license.
- **You may:**
    - Do whatever you want with **LST** in your own home
    - Use the provided utilities to create products (paid or free) that use **LST**
    - Create and sell products (paid or free) that use **LST**
- **You may not:**
    - Redistribute the **LST** plugin itself (the reason is, I don't want a bunch of different versions running around creating a stability nightmare)
    - Redistribute the utilities for developing for **LST**
    - Portray that you are the developer of **LST**. You don't have to give credit for **LST**, just don't indicate you made it or anything along those lines.
    - Do anything unethical or illegal
- By using this plugin or it's utilities, you agree to use it in a responsible manner that does not impact other addons or the core simulator/
- By using this plugin or it's utilities, you agree that **I am not responsible for anything bad that may happen as a result.**
- I may offer support as a courtesy; however, I am not obligated to provide support or this plugin or utilities.
- If you have any questions or want to discuss an exception, please contact me via my website, x-codrdesigns.com.

1.3 – Installation

To install Living Scenery Technology, please follow these instructions.

- Copy Living Scenery Technology into <X-Plane Root Folder>/Resources/Plugins
- Enjoy!

The developer tools are standalone executable, just put them in a folder where you can find them.

1.4 – Preferences

LST has optional preferences. It belongs in XP Path/Resources/plugins/Living Scenery Technology/Prefs.lst. The format is COMMAND,VALUE followed by a newline. Valid commands are

- TIMEMODE, SIM or REAL. Sim uses sim timing for animation, real uses real timing for animation. This defaults to real, but if you want vehicles to progress along routes faster when the sim time is running faster (for example by using shift L), set it to SIM.
- PRESISTENT_CACHE, TRUE or FALSE. Can reduce loading load when leaving then returning to a scenery area, you probably don't need to mess with this.
- DEBUG, TRUE or FALSE. Always leave this as false, unless you run into an issue and need to send me your log.txt.

10 – A Very Long Changelog

- **Version 1.11.2; 3/23/2024**
  - **Bug Fix:**
  - **Fixed:**
    - Crash when unable to locate object
- **Version 1.11.1; 2/15/2024**
  - **Bug Fix:**
  - **Improved:**
    - Logging is more reliable and cleaner.
    - Data access now has bounds checks, when something goes wrong, plugin should stop without crashing sim.
  - **Fixed:**
    - Fixed trains not deactivating after leaving scenery area causing crash when returning.
- **Version 1.11; 1/10/2024**
  - **Feature:**
  - **Added:**
    - Smooth turning around corners
    - Per object instance animation Dataref for animation variations
    - Enabled PCL system (controlled by sceneries, activated by XP's PTT, or LST's PTT command)
  - **Improved:**
    - Made docs more concise and clear
    - DREFWAIT and DREFSET vs giant DREFOP command
  - **Fixed:**
    - Various file reading issues
- **Version 1.10; 9/2/2023**
  - **Feature + Bug Fix:**
  - **Added:**
    - DEBUG and PRESISTENT_CACHE to Prefs.lst
    - MINVER, PRIMETIME, and ACTIVEDREF to Init.lst.
    - Optional initial alt for HIGHWAYs and LOOPs
    - PITCHLESSSTART and PITCHLESSEND for objects to always have 0 pitch.
  - **Improved:**
    - Objects are culled based on LOD (to handle X-Plane bug causing this not to be automatic)

- Trains don't fall apart anymore. Their relative spacing is fixed and always absolute.
- All loading is now async
  - **Fixed:**
    - Linux version compiled wrong
    - Various small bugs.
- **Version 1.09.4;** 6/26/2023
  - **Feature + Bug Fix:**
  - **Added:**
    - Official support for Apple Silicon (M1s and M2s)
  - **Fixed:**
    - Legacy Object/DREF commands not working
    - Datarefs possibly not being registered early enough
- **Version 1.09.1/2/3**
  - **Removed accidental debug logging**
- **Version 1.09;** 6/4/2023
  - **Feature + Bug Fix**
  - **Added:**
    - Support for Dataref Keyframe Tables
    - Plugin preferences. Now uses real time, sim time can be specified in preferences.
  - **Improved:**
    - Support for symlinks and Windows Shortcuts
  - **Fixed:**
    - Non-ASCII file names caused a crash
    - LOOPs caused memory leak/crash
- **Version 1.08.1;** 4/27/2023
  - **Bug Fix:**
  - **Fixed:**
    - Trains go off route on last WP
- **Version 1.08;** 4/26/2023
  - **Feature + Bug Fix**
  - **Added:**
    - BRANCHIF support, allowing for objects to branch based on a dataref.
    - SPAWNFACTOR support, allowing for highways to have their spawn times multiplied by a dataref.
    - CAP support for Datarefs, Datarefs can be limited.
  - **Improved:**
    - Support for multiple DREFOPs per WP.
    - You no longer need to specify types for DREFOPs, BRANCHIFs, or VALUEs (legacy commands still work).

- All operands in DREFOPs, VALUEs and BRANCHIFs can be explicit values, or Datarefs.
- Clearer logging.
- Large rewrite of internals for better maintenance and reliability.
- Comments, REVERSE, GONDOLASTART/END no longer require a comma following the command
  - **Fixed:**
    - File paths not being found due to improper handling of line endians on Mac and Linux
    - Spawn time randomization severely wrong
- **Version 1.07;** 1/26/2023
  - **Bug Fix**
  - **Fixed:**
    - Train elevation imprecision at low altitudes
    - Plugin using old plugin naming scheme
- **Version 1.06;** 12/2/2025
  - **Bug Fix**
  - **Fixed:**
    - Last route not being added if text after last WP.
    - Fixed last leg of LOOP having slight chance of BRANCHing to the first route
    - Various fixes in LST Converter
    - New Route spacing adjustment tool for LST Generator
- **Version 1.05;** 10/25/2022
  - **Feature + Bug Fix**
  - **Added:**
    - Optional route priming. Developers can set the package to run at 1.5 seconds per frame until it has effectively run *x* number of seconds in order to "prime" their roads.
    - Timing is now based off sim time. The objects speed up with sim time, and pause works. Note objects are limited to a max speed of1.5 seconds per frame for internal reasons.
  - **Improved:**
    - Operations can now occur on the last leg
    - Smooth turning of train cars
  - **Fixed:**
    - Actually implemented the better AGL precision that *should* have been in 1.04 🙄
- **Version 1.04;** 9/24/2022
  - **Bug Fix**
  - **Added:**
    - Ability to restart plugin after a fatal error without restarting the sim

- Support for zero length legs (used to result in DBZ error). Useful for multiple DREFOPs
  - **Improved:**
    - Support for routes above 3000 meters
    - Improved AGL precision
  - **Fixed:**
    - TRAINs and LOOPs not properly respawning after leaving an area and returning
    - Apparently an X-Plane 11 bug (I'm told 1.03 didn't work and 1.04 does)
- **Version 1.03;** 9/11/2022
  - **Bug Fix**
  - **Fixed:**
    - Incorrect file paths on Mac
    - Never spawning LOOP objects
- **Version 1.02;** 9/7/2022
  - **Bug Fix**
  - **Fixed:**
    - DBZ Error on LOOP commands
- **Version 1.01;** 9/6/2022
  - **Bug Fix**
  - **Fixed:**
    - Wrong plugin description
    - Broken VALUE command
- **Version 1.0;** 9/5/2022
  - **Initial Release**
- **Version 0.94**; 8/31/2022
  - **Release Candidate**
  - **Added:**
    - BRANCH command
    - Non random spawn times (enter -1 in max spawn)
    - Non spawning routes (enter -1 in min spawn)
    - Mac version
    - Updated Linux version
    - Clamped spawn times to integers in LST Converter
    - Increased init ranges in LST Converter and LST Generator
  - **Fixed:**
    - REVERSE command not working
    - Objects having prior leg's parameters for one frame
- **Version 0.93**; 8/29/2022
  - **Close Beta** release
  - **Fixed:**

- ▪ Routes using the object from the next route.
  - o **Known bugs:**
    - ▪ Linux version out of date (and crashed when max and min spawn times are the same)
    - ▪ Mac version not compiled
    - ▪ No user manual
- **Version 0.92**; 8/29/2022
  - o **Close Beta** release
  - o **Fixed:**
    - ▪ LST Converter adding whitespace to resource in highway
  - o **Known bugs:**
    - ▪ Linux version out of date (and crashed when max and min spawn times are the same)
    - ▪ Mac version not compiled
    - ▪ No user manual
- **Version 0.91**; 8/28/2022
  - o **Closed Beta** release
  - o **Fixed:**
    - ▪ Fixed spacing values being in scientific notation on very long decimals in LST Converter
    - ▪ Fixed route being lost due to space in object name in LST Converter
    - ▪ Fixed gondola altitude jumping below terrain at start of leg on steep slopes
    - ▪ Fixed missing package name in logging
    - ▪ Fixed missing object name in logging when object could not be found
  - o **Added:**
    - ▪ Added ability to load local objects not exporter via Library.txt
    - ▪ Added manual table of contents
  - o **Known bugs:**
    - ▪ Linux version out of date (and crashed when max and min spawn times are the same)
    - ▪ Mac version not compiled
    - ▪ No user manual
- **Version: 0.9**; 8/21/2022
  - o Initial **Closed Beta** release
  - o **Known bugs:**
    - ▪ Linux plugin crashes from DBZ when min spawn time and max spawn time are the same
    - ▪ Mac plugin not yet compiled