ETFOMM Compile, Run, Edit, and Animation Instructions

For ETFOMM 2.2 Only

October 1, 2024

Please review the license terms and copyright notes at the end of the document.

1. Prerequisites

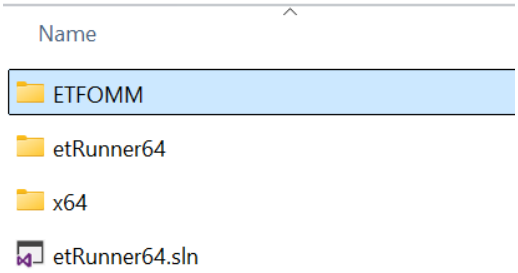
- **Install Software**:
  Install *Visual Studio Professional* or *Visual Studio Community* version, and **Intel ONEAPI Base** with **oneAPI HPC** add-on (which includes Intel FORTRAN).
- **Tested Versions**:
  This version of ETFOMM is debugged, compiled, and tested on the following versions:
  - Visual Studio Professional 2022 (64-bit), Version 17.9.6 or Visual Studio Community 2022 (64-bit), Version 17.11.2. *Note: Visual Studio is a trademark of Microsoft Corporation.*
  - Intel® oneAPI 2024.1 plus oneAPI HPC (including Intel® Fortran Compiler 2024 *Note: Intel® oneAPI and libiomp5md.dll are intellectual property of Intel Corporation*.
- **Test Setup**:
  Ensure you can compile at least one C++ and Intel FORTRAN example before compiling ETFOMM.

Here is a refined version of the **ETFOMM 2.2 Compile Instructions** document with clearer formatting and enhanced readability:

2. Preparing Files and Directories

Note: This version (2.2) is designed for Windows 64 (tested on Windows 11). Previous versions (2.0 and earlier) were tested and run on both Windows and Linux platforms.

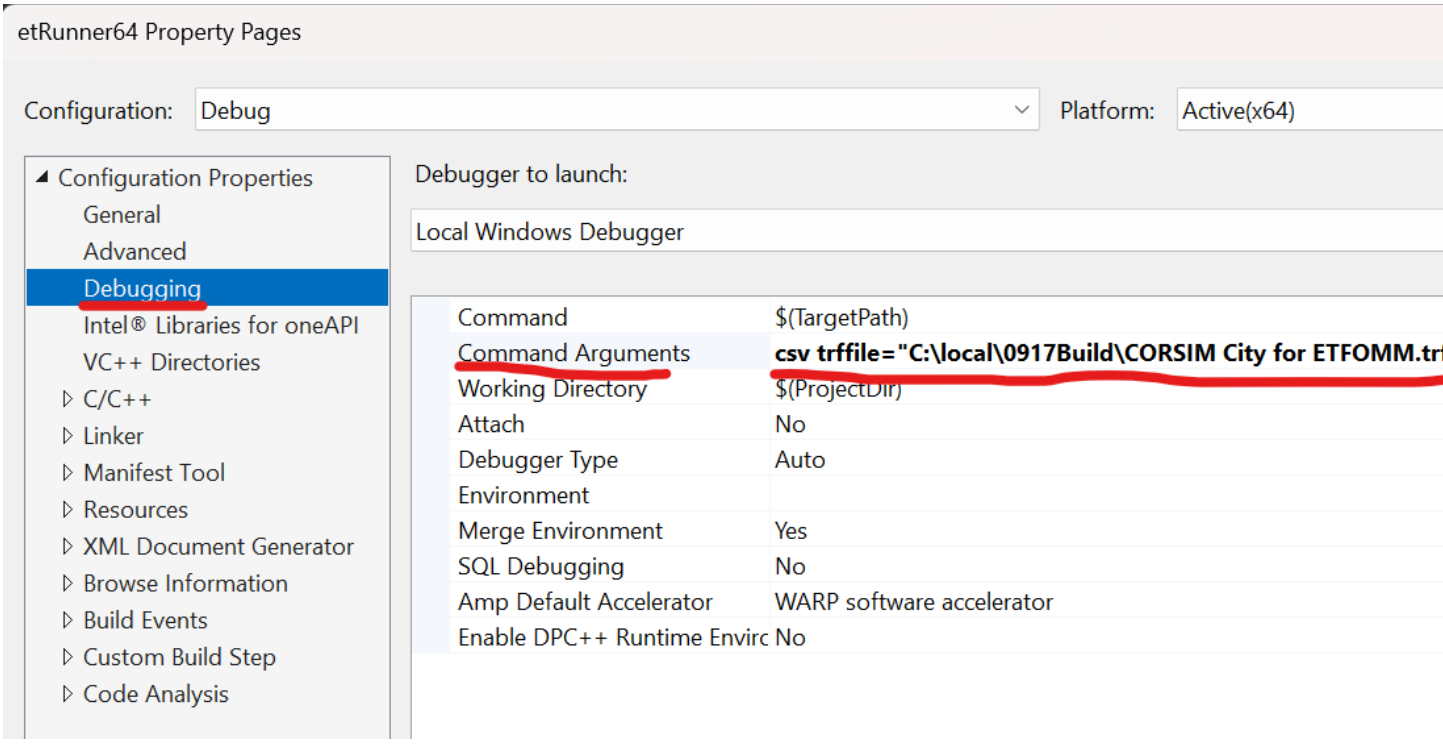
- **Directory Structure**:
  Download or clone the files. Verify that the source code is correctly structured to support Windows 64-bit binary compilation.
  - **2.1 ETFOMM Directory**:
    Stores all FORTRAN source code module definitions and header files related to ETFOMM. It will compile into a DLL, e.g., `etfomm64.dll`.
  - **2.2 ETRunner64 Directory**:
    Stores all source files to load `ETFOMM64.dll`, execute the simulation, and call other simulation-related functions such as writing TXT files.



- **Compiling Projects**:
  You may compile either ETFOMM or ETRunner, or both the same time. Please ensure you are building for X64 for debugging or release. Project configuration files allow control over output file names and locations.
    - ETFOMM DLL files should be saved in the same directory as the `etRunner64.exe` file.
    - Example compile output

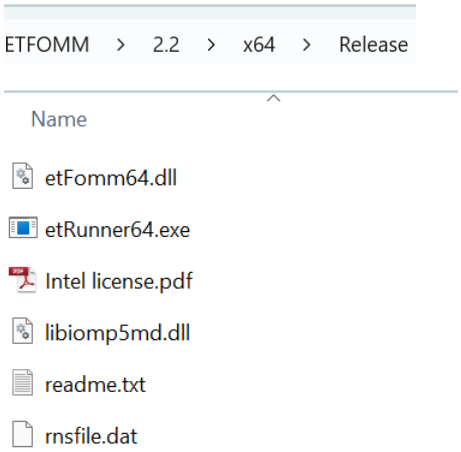
3. Debugging TRF Files

- **Set the TRF File for Debugging**:
  Before running a simulation, specify the desired TRF file to debug.



4. Running Binary Code

Running the binary code requires the Intel libiomp5md.dll library. Please review Intel's licensing terms in the IntelLicense.PDF file. Please browser ETFOMM\2.2\C64\Release folder, download all files



The readme file contains the command line below. You may copy and paste.

Example command to run:

"D:\ETFOMM\0917\etRunner64\x64\Release\etRunner64.exe" csv trffile="C:\local\0917Build\CORSIM City for ETFOMM.trf" txt

5. Output Files

After execution, the following files are generated:

1. **CSV File**: Contains link/lane/network-based Measures of Effectiveness.
2. **TXT Files**: Contain vehicle trajectories and animation data.

6. Editing TRF Files

Currently, there are no open-source editors for TRF files. In theory, any text editor (e.g., Notepad, Word) can be used to create a TRF file based on the ETFOMM reference manual. However, editing TRF files manually is impractical, especially for large networks.

Commercial Options:

- **ETEditor by New Global Systems**:
  Visit etfomm.org or contact ngsim@ngsim.com for a potential free trial.- www.etfomm.org
- **TRAFED in TSIS Software,**
  Visit McTrans for details. https://mctrans.ce.ufl.edu/tsis-corsim

7. Animations

Similar to TRF file editing, there are no known open-source animators for ETFOMM trajectory TXT files. There are, however, a few commercial options:

- **ETAnimator by New Global Systems**:
  Visit etfomm.org or contact ngsim@ngsim.com for a potential free trial.
- **TRAFVU in TSIS Software**:
  Visit McTrans for more information. *Note: TSIS is a software package Copyrighted by McTrans and ITT Industries*
- **3ds Max from Autodesk**:
  This software can be used to create professional animations from the vehicle trajectories in a TXT file. Note: 3ds Max is intellectual property of Autodesk, Inc.

8. ETFOMM 32 Bit Support

We have not tested or built 32-bit versions of **ETRunner** and **ETFOMM**. Keep in mind that **ETFOMM** is written in FORTRAN, where the default calling convention is __stdcall. While we do not officially support 32-bit builds at this time, the 32-bit version of **ETFOMM32.dll** has been thoroughly tested and works seamlessly with **TSIS 32-bit** components. See the details below for more information.

9. ETFOMM 32 to Support TSIS

TSIS (Traffic Software Integrated System) is a traffic simulation software package developed by the University of Florida and ITT Industries. The specific version integrated with ETFOMM, TSIS Version 5.3 prior to 2005, is developed by ITT Industries for the Federal Highway Administration (FHWA) Office of Operations Research and Development. ETFOMM32 can replace FHWA's traffic simulation engineer CORSIM (CORridor Simulation)

For the successful operation of ETFOMM32.dll with TSIS 5.3 and above, you must ensure the correct version of TSIS and all required components (such as CORWIN.DLL and TxDInterface.lib) are properly installed

The 32-bit **ETFOMM32.dll** is fully compatible with **TSIS 5.3** and later versions. To compile and build the 32-bit DLL, you will need two key components from the **TSIS package**:

1. **CORWIN.LIB**
2. **TxDInterface.lib**

These files are typically included in standard **TSIS** distributions but are **not included** with the ETFOMM package. Once you have these components:

1. Load `etfomm32.sln` into **Visual Studio**.
2. Compile and build the **ETFOMM32.dll**.

This will ensure that **ETFOMM 32-bit** is ready for use with TSIS.

10. ETFOMM 32 to Generate TRAFVU File

First, you will follow "**9. ETFOMM 32 to Support TSIS**" to build ETFOMM32 to work with TSIS. ETFOMM works with TSIS to convert ETFOMM trajectory data from text files to TRAFVU files (*.ts0). The trajectory data in a text file can be generated by ETFOMM 64 or 32. You must change Entry 01 in RT2 to 4, and re-run ETFOMM32 in TSIS to make the conversion. Here is the copy in the ETFOMM Reference manual.

RT02: Entry 01

This entry specifies a code (as described in the following table) that determines the nature of the run.

Value	Description
0	Run simulation model without error checking (ETFOMM only)
1	Run simulation model with error checking
4	Convert ETFOMM animation text files to TRAFVU animation files (ETFOMM only)

However, if you don't want to change Entry 01 in RT2 back and forth between 1 and 4, you could compile a special version of ETFOMM32 to make the conversion, disregarding Entry 01 of RT02.

Go to "SUBROUTINE READ_RT02(STRING, INET)" in "Get_Network_Data.F90", disable " TYPE_OF_RUN = IBUF(1)", add "TYPE_OF_RUN =4". Your statement looks like this:

```
! ------------------------------------------------------------------------------
  SUBROUTINE READ_RT02(STRING, INET)
! ------------------------------------------------------------------------------
!     Run Control
! ------------------------------------------------------------------------------
  USE SIMPARAMS
  USE ENTRYNODE_DATA
  USE SEEDS
  USE GLOBAL_DATA
  USE FREEWAY_VEHICLES
  USE STREET_VEHICLES
  USE TEXT
  IMPLICIT NONE
  CHARACTER*80, INTENT(IN) :: STRING
  INTEGER, INTENT(OUT) :: INET
  INTEGER :: IBUF(20), ISEED(2)
! ------------------------------------------------------------------------------
  READ(STRING, '(I8,3I4,1X,I8,1X,2I2,2X,2I1,1X,3I1,2I2,5X,I1,I4,3X,I1,2I8,I1)') IBUF
  !  TYPE_OF_RUN = IBUF(1)
  ! Harcoded by LZ for processing anamation file
  TYPE_OF_RUN = 4
```

Build ETFOMM32.DLL. This is the file you will need to call in the TSIS environment to process trajectories from ETFOMM to the TRAFVU file.

11. ETFOMM License Term

This program is free software: you can redistribute it and modify it under the terms of the **GNU Affero General Public License** as published by the Free Software Foundation, either version 3 of the License or (at your option) any later version.

This program is distributed in the hope that it will be useful, but **WITHOUT ANY WARRANTY**, without even the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE. See the **GNU Affero General Public License** for more details.

You should have received a copy of the GNU Affero General Public License along with this program. If not, see GNU Licenses.

12. Intellectual Property Notes and Trademarks:

- **Intel®** and **Intel® oneAPI** are trademarks or intellectual property of **Intel Corporation**.
- **Visual Studio** is a trademark or intellectual property of **Microsoft Corporation**.
- **3ds Max** is the intellectual property of **Autodesk, Inc.**.
- **TSIS**: Portions of TSIS are copyrighted by the University of Florida (2008-2011) and ITT Industries, Inc. (1995-2005). All rights reserved.