

**LIVERPOOL TRANSPORTATION MODELING TECHNICAL MEMO
MAY 2009**



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Executive Summary: Liverpool Modeling Tech Memo

The Syracuse Metropolitan Transportation Council (SMTC) completed the Village of Liverpool Transportation Modeling project on behalf of the Town of Salina and Village of Liverpool. The purpose of this project was to examine existing transportation conditions and plan for future transportation conditions through the use of the SMTC's Travel Demand Model (TDM).

This project included collection and/or verification of appropriate transportation, land use, and demographic data within the study area. The project assessed current and future transportation conditions within the Village through analysis of various transportation and/or land use alternatives. Several alternatives were run utilizing the TDM, and a technical memorandum summarized the findings. The project was completed utilizing the SMTC staff with support, input, and participation from the SMTC's member agencies.

The SMTC TransCAD travel demand model was used for this project, which is a regional model and not meant for small area detailed analysis, including intersection or road segment (link) analysis. The SMTC's model is meant to show regional impacts, not individual localized impacts. The following base and alternatives for the Liverpool Modeling project scenarios are all PM peak runs. Each of the alternatives is compared to the future base (2027).

The target for this project was to determine if there were any feasible alternate options to decrease the traffic in the Village by approximately 15%-20% as stated in the Village's Commercial Market and Retail Analysis.

Round 1 Results Summary

Base: Current (2003) and Future (2027)

The volume to capacity (v/c) base maps show no failing segments in the greater Liverpool area for the 2003 base map. The 2027 future base maps shows areas of concern on Oswego Street just north of Heid's and Rt. 370, north of the Village. The I-90 ramp from Rt. 57 is over capacity and other portions of I-90 southeast of the Village are nearing capacity. These areas that are at and near capacity are consistent with the rest of the v/c Alternative 1-7 maps.

Alternative 1: Liverpool Bypass

The results of this alternative showed a sharp increase in traffic on the current portion of the Liverpool Bypass. The Parkway and Old Liverpool Road remain virtually unchanged. The east-west connectors in the Village decrease in traffic as well. This alternative significantly reduces traffic in parts of the Village.

Alternative 2: Speed/Capacity/Classification Changes

The results of this alternative showed reduced traffic volumes on the Parkway by 38%. A significant amount of traffic is diverted to Old Liverpool Road. This alternative decreases

traffic in the Village in the range of 8% to 17%. This alternative has more vehicle reduction impacts than the similar Alternative 3 in the Village.

Alternative 3: Speed/Capacity/Classification Changes

The results of this alternative showed a significant impact on the traffic on the Parkway. More than half of the traffic is diverted to Old Liverpool Road. This decreases traffic ranging from about 6-12% in the Village. This alternative does result in a small decrease in traffic in the Village, but impacts Old Liverpool Road with a level of service E.

Alternative 4: Speed/Capacity/Classification Changes

This alternative moves traffic from Old Liverpool Road to the Parkway (and Buckley) with minimal reduction in volume through the Village. This alternative has a minimal impact on the Village.

Alternative 5: Speed/Capacity/Classification Changes

This alternative decreases traffic on Old Liverpool Road, therefore the traffic shifts to the Parkway and Buckley Road. There is an insignificant volume decrease in the Village (overall a 1% decrease). This alternative has a minimal impact on the Village.

Alternative 6: Traffic Calming

This alternative reduces volume on Parkway by 54%. Also, produces a large increase in the traffic on Old Liverpool Road. In the Village traffic decreases consistently around 20%. This alternative provides a decrease in traffic similar to Alternative 1: Liverpool Bypass, but without as much monetary commitment.

Alternative 7: Retail Changes

The results of this alternative showed not much change in the entire network, but a 12%-14% increase on Liverpool Bypass. Traffic in the Village is increased by 1%-3%.

Round 2 Results Summary

For Round 2, the SAC determined that the Thruway is an important aspect of reducing traffic in the Village. Therefore, removing tolls for the Thruway between exits 36-39 (690 and 81) was included in each Round 2 alternative. Additionally, the model was run with the same alternatives, but with the Thruway tolls in effect (Alternatives 2B, 3B, and 4B).

Round 2, Alternative 1: No User Fees on the Thruway

The results of this alternative showed that traffic increased on the Thruway 8%-16% and decreased in the Village 3%-6%.

Round 2, Alternative 2: Parkway Speed and Lane Reduction & Old Liverpool Rd Speed and Lane Reduction & No User Fees on the Thruway

The results of this alternative showed Old Liverpool Road is nearing capacity, but Oswego Street just north of Heid's is improved. This alternative exceeds goal of 20% reduction of traffic in the Village.

Round 2, Alternative 2B: Parkway Speed and Lane Reduction & Old Liverpool Rd Speed and Lane Reduction

The results of this alternative showed a 20% reduction in traffic in the Village is still met, even with about a 4% increase in traffic (compared to Round 2, Alternative 2) due to the existing toll system on the Thruway.

Round 2, Alternative 3: Traffic Calming in the Village & Parkway Speed Reduction & No User Fees on the Thruway

The results of this alternative showed significant volume reduction on Parkway, as well as significant volume increase on Old Liverpool Road and Thruway. This alternative meets goal of 20% reduction of traffic in the Village.

Round 2, Alternative 3B: Traffic Calming in the Village & Parkway Speed Reduction

This alternative meets the goal of reducing traffic in the Village, and also does not disproportionately impact the LOS on any roads.

Round 2, Alternative 4: Traffic Calming in the Village & Parkway Lane Reduction & No User Fees on the Thruway

The results of this alternative showed significant volume reduction on Parkway, and significant volume increase on Old Liverpool Road and Thruway. This alternative almost meets goal of 20% reduction of traffic in the Village.

Round 2, Alternative 4B: Traffic Calming in the Village & Parkway Lane Reduction

The results of this alternative showed significant volume reduction on Parkway and significant volume increase on Old Liverpool Road. There was about a 15% reduction of traffic in the Village.

Conclusions

A handful of scenarios meet the village traffic reduction goal of 15-20%. (Round 1 Alternatives 1 and 6; and Round 2 Alternatives 2, 3, 2B, 3B, 4B). In all Round 1 and 2 scenarios, many major connectors change to LOS E except for two scenarios (Round 2, Alternatives 3 and 3B). The speed decreases and loss of reserve capacity can be tolerated, but the LOS E/F is not generally acceptable. Therefore, the alternative with the most support is Round 2, Alternative 3/3B. Based on the modeling results, implementing changes in capacity on Village roads is more effective in diverting traffic than removing user fees on toll roads.

Given current circumstances, it is not likely that the Thruway would consider removing user fees for portions of local trips. Yet, this Tech Memo could result in future study to determine if it would be advantageous to pursue that option further. In addition to the question of removing user fees for portions of the Thruway, providing an incentive or guiding traffic to use the Thruway was discussed as part of this modeling effort.

Liverpool Modeling Executive Summary

Overall, this study met its intended goal (to look at options to determine if further study is warranted). Liverpool Bypass (Round 1) met the traffic reduction goals, but it is the most financially expensive option. Round 2, Alternatives 3 and 3B could also possibly be considered in a future study to reduce traffic in the Village.

Member agency comments included concern regarding traffic being moved from the Village only to be concentrated on other roads in the area. If traffic is dispersed evenly on a number of roadways, the changes in volume would be manageable.

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1. Project Background

As part of the 2007–2008 Unified Planning Work Program (UPWP) under the Transportation Demand Modeling task, the Syracuse Metropolitan Transportation Council (SMTC) agreed to complete the Village of Liverpool Transportation Modeling project on behalf of the Town of Salina and Village of Liverpool. The purpose of this project was to examine existing transportation conditions and plan for future transportation conditions through the use of the SMTC's Travel Demand Model (TDM). This project carried over to the 2008–2009 program year for completion.

This project included collection and/or verification of appropriate transportation, land use, and demographic data within the study area. The project assessed current and future transportation conditions within the Village through analysis of various transportation and/or land use alternatives. Several alternatives were run utilizing the TDM, and a technical memorandum summarized the findings. The project was completed utilizing the SMTC staff with support, input, and participation from the SMTC's member agencies. A working group was formed to guide the study.

The major project components, identified in task format, follow in this memo. The project, commenced during the 2007–2008 Unified Planning Work Program (UPWP) year, was estimated to be completed in approximately 6-8 months from the date this scope of work was approved.

Given that the result of this project is a technical memorandum and not a complete transportation study, the project outreach was limited to the working group meetings. There was not any additional public outreach or formal public meetings associated with this study. If any of the alternatives from this study require an additional study, appropriate public outreach and formal public meetings will be implemented at that time.

The SMTC TransCAD travel demand model was used for this project, which is a regional model and not meant for small area detailed analysis, including intersection or road segment (link) analysis. The SMTC's model is meant to show regional impacts, not individual localized impacts. It should be noted that the 2027 future base model includes Phase 1 (800,000 square feet) of the Destiny USA project only. The SMTC model is a 24-hour model based on a weekday and does not model weekend conditions.

The target for this project was to determine if there were any feasible alternate options to decrease the traffic in the Village by approximately 15%-20% as stated in the Village's Commercial Market and Retail Analysis.

2. Scope of Work

The following is the scope of work for the Liverpool Transportation Modeling Project, approved in November 2007.

Task 1: Determination of Study Area and Base Model Verification

The area of influence or project study area will be determined by the working group and SMTC staff during the first working group meeting. With input from the working group, the SMTC will then verify and update the existing and future base TDM in and adjacent to the study area. This task will include field work and review of existing data to validate existing and future base land use and transportation data in the TDM.

Task 2: Develop Preliminary Alternatives

The SMTC staff will meet with the complete working group to develop a list of potential alternatives to address the transportation related issues, needs and goals identified by the Village of Liverpool and Town of Salina. This will be a cooperative process to develop a complete list of land use and transportation alternatives. The working group will then reduce this list to a reasonable number of representative alternative scenarios.

The product of this task will be a list of alternatives to be evaluated in Task 3. This task will include the development of up to 6 preliminary transportation and/or land use alternatives. The factors used for the comparison of alternatives will be determined during a working group meeting and may include such things as directional volumes and volume to capacity ratios.

Task 3: Preliminary Alternatives Modeling

SMTC staff will revise the existing (2003) and/or future (2027) base model to reflect each alternative scenario defined during Task 2. Since it is not necessary to complete a TDM run for each alternative for the existing and future model years the working group will determine the potential implementation time frame for each alternative. An implementation time frame will help determine the base year used to model and compare the alternatives. Each alternative will then be run for the appropriate base year and the outputs will be relatively compared to each other and the base model outputs. Mapping and/or data tables will be prepared to display and compare the alternative results.

Task 4: Revised Alternatives Modeling

Upon completion and review of the preliminary alternatives, the SMTC and working group will revise the preliminary alternatives or generate new alternatives during a working group meeting. These additional alternatives will be dependent on the findings of the preliminary alternatives. The results from the first runs may not necessarily meet the goals of the Town and Village. Therefore, the original alternatives may need modifications. The SMTC staff will run up to 4 additional transportation and/or land use alternatives based on working group comments.

Task 5: Comparison of Alternatives

A technical memorandum will be created by SMTC staff and will highlight each alternative scenario and their outputs. Maps and/or tables will be used to display the change in transportation conditions between each alternative and the 2003 and/or 2027 base model.

Deliverables

SMTC staff will generate a technical memorandum with input from the working group. This report will include a brief narrative as well as maps, tables and charts as necessary.

3. Round 1: Modeling Research, Results Summary

Research

In preparation for Round 1, background research was completed to verify and support the modeling scenarios. For example, in Alternative 7: Retail Changes, research was completed to determine the average number of employees per square foot for a big box retail store. Therefore, the decisions regarding the details of the model runs were determined with prior research in mind.

The documents reviewed for supporting information in preparation to run the scenarios included Liverpool Comprehensive Plan, Liverpool-Onondaga Lake Transportation Study, Onondaga County Settlement Plan, historical newspaper articles, and internet research. Supporting documentation was collected for traffic calming, retail changes, narrowing lanes (via reducing capacity), feasibility for new roadway connections including historical data, and lane and speed reduction.

Results Summary

The following base and alternatives for the Liverpool Modeling project scenarios are all PM peak runs. Each of the alternatives is compared to the future base (2027). In reviewing the alternatives, it is important to look at the entire network changes and less specifically at individual road changes. Please remember that the SMTC travel demand model is meant for analyzing regional changes and not specific road or intersection functionality. The target for this project was to determine if there are any feasible alternate options to decrease the traffic in the Village by approximately 20%.

Base: Current (2003) and Future (2027)

Description: These base runs are to be used as a comparison to the other scenarios. The future base conditions were determined by community representatives during model development.

Results: N/A

Notes: The volume to capacity (v/c) base maps show no failing segments in the greater Liverpool area for the 2003 base map. The 2027 future base maps shows areas of concern on Oswego Street just north of Heid's and Rt. 370, north of the Village. The I-90 ramp from Rt. 57 is over capacity and other portions of I-90 southeast of the Village are nearing capacity. These areas that are at and near capacity are consistent with the rest of the v/c Alternative 1-7 maps.

Alternative 1: Liverpool Bypass

Description: Creating a connection from Vine Street to Rt. 370 (about 2 miles). Functional Classification of the Bypass is Minor Arterial, speed is 55 mph, 24 hour capacity = 12,000 per lane.

Results:

- There is a sharp increase in traffic on the current portion of the Liverpool Bypass. Therefore, upgrades to this portion of the road may be necessary.
- The total volumes on the new west and east portions of the Liverpool Bypass are 1516 and 2059 respectively. The eastern segment of the new bypass is already nearing capacity.
- Many other east-west connectors increase in traffic also, including West Taft Road (28%), Hopkins Road (21%), and Long Branch Road (69%).
- The Parkway and Old Liverpool Road remain virtually unchanged.
- The portion of Vine Street through the Village increases significantly (43%), while the remaining portion up to Henry Clay decreases significantly (65%).
- This alternative significantly reduces traffic in parts of the Village (6% on Oswego Street, 16% on Tulip Street, 22% on 2nd Street). The east-west connectors in the Village drop as well (30%-50%).
- V/C map for Alternative 1: the current Liverpool Bypass is at LOS F, as well as Rt. 370 north of the Village. Also, there is LOS E on Oswego Street just north of Heid's.

Notes: If building a connector is feasible, this option may produce significant changes to the traffic pattern in the area of the Village. This option did not include a feasibility study of building the new connector (i.e. ROW, land use, etc.). Onondaga County never purchased the right-of-way for the complete bypass.

Alternative 2: Speed/Capacity/Classification Changes

Description: Decrease speed to 35 mph year round on Onondaga Lake Parkway. Speed reduction was on the Parkway from 55 mph to 35 mph.

Results:

- Reduces traffic volumes on Parkway by 38% (1,200+ vehicles).
- A significant amount of traffic is diverted to Old Liverpool Road (42%-77%).
- Also increases on Buckley, I-81/481/I-690/I-90, though the traffic is dispersed fairly evenly onto these roads (which had the capability for increased capacity).
- This alternative decreases traffic in the Village in the range of 8% to 17%.
- V/C is acceptable on Old Liverpool Road and the Parkway. No other significant changes.

Notes: This alternative has more vehicle reduction impacts than the similar Alternative 3 (Parkway = 1 lane) in the Village.

Alternative 3: Speed/Capacity/Classification Changes

Description: Decrease number of lanes on Onondaga Lake Parkway (1 lane each direction). No speed reduction.

Results:

- This scenario has a significant impact on the traffic on the Parkway.

- More than half of the traffic is diverted to Old Liverpool Road (36%-63% increase), and some traffic also goes to Buckley as well as I-690/I-90/481.
- This decreases traffic ranging from about 6%-12% in the Village.
- V/C is acceptable in the Village. The Parkway decreases to a LOS E due to the lane reduction.

Notes: This alternative does result in a small decrease in traffic in the Village, but impacts Old Liverpool Road with a LOS E.

Alternative 4: Speed/Capacity/Classification Changes

Description: Decrease speed to 35 mph on Old Liverpool Road. Speed reduction from 40 mph to 35 mph.

Results:

- Moves traffic from Old Liverpool Road to the Parkway and Buckley with minimal reduction in volume through the Village (2%).
- V/C is acceptable in the Village (except for the portion of Oswego Street just north of Heid's) as well as the Parkway and Old Liverpool Road.

Notes: This alternative has a minimal impact on the Village.

Alternative 5: Speed/Capacity/Classification Changes

Description: Decrease number of lanes on Old Liverpool Road (1 lane each direction). No speed reduction.

Results:

- Decreases traffic on Old Liverpool Road (20%), therefore the traffic shifts to the Parkway and Buckley Road.
- Insignificant volume decrease in the Village (overall a 1% decrease).
- V/C is acceptable in the Village as well as the Parkway and Old Liverpool Road.

Notes: This alternative has a minimal impact on the Village.

Alternative 6: Traffic Calming

Description: Reduce number of lanes on Oswego Street in Village of Liverpool (1 lane each direction), reduce number of lanes and speed on Onondaga Lake Parkway (1 lane each direction, 35 mph), narrow lanes on Oswego Street and Tulip Street. Narrowing lanes on Oswego Street and Tulip Street (results in a capacity reduction by 7%). Assumption of narrowing lanes from 12 feet to 10 feet.

Results:

- Reduces volume on Parkway by 54% (approximately 1,700 vehicles).
- This alternative produces a large increase in the traffic on Old Liverpool Road (48%-74%).

- Traffic is also distributed to Buckley Road, 81/481, Henry Clay Blvd., and 690. Decreases in traffic occur on Morgan Road as well as Rt. 57 and Rt. 370.
- In the Village, including the CBD, traffic decreases consistently around 20% (11%-32%).
- V/C is acceptable in the Village as well as the Parkway and Old Liverpool Road. Due to the lane reduction, Oswego Street north of Heid's is over capacity.

Notes: This alternative provides a decrease in traffic similar to Alternative 1: Liverpool Bypass, but without as much monetary commitment.

Alternative 7: Retail Changes

Description: Add big box retail on corner of Rt. 57 and Liverpool Bypass. The big box that is modeled is approximately 220,000 square feet and 400 employees (1.81 employees per 1,000 square feet retail).

Results:

- Not much change in the entire network, but a 12%-14% increase on Liverpool Bypass.
- Not much change on Route 57, but the traffic increases on Tulip and Commerce (increase is split between the two).
- No significant changes in v/c from the 2027 base.

Notes: Traffic in the Village is increased by 1%-3%.