

Table of Contents

1. Introduction	1-1
1.1 Project Goals and Objectives.....	1-1
1.2 Study Area	1-2
1.3 Study Process.....	1-2
1.4 Public Participation	1-3
1.5 Project Staff	1-5
2. Existing Conditions	2-1
2.1 Study Area Demographics.....	2-1
2.2 Existing Traffic Demand.....	2-2
2.2.1 Daily Volumes	2-2
2.2.2 Peak Hour Volumes	2-3
2.2.3 Surface Street Traffic Volumes	2-5
2.2.4 Trucks	2-6
2.2.5 Mainline Speeds.....	2-6
2.3 Geometrics.....	2-8
2.3.1 Methodology/Review of Geometrics	2-8
2.3.2 Interchange Spacing	2-11
2.3.3 Other Geometric Issues	2-13
2.4 Existing Traffic Operations.....	2-13
2.4.1 Methodology/Criteria	2-14
2.4.2 Mainline Operations	2-15
2.4.3 Ramp Operations	2-17
2.4.4 Weaves	2-20
2.4.5 Intersections.....	2-22
2.5 Safety Analysis	2-31
2.5.1 Methodology.....	2-31
2.5.2 Qualitative Description	2-32
2.5.3 Quantitative Accident Data.....	2-32
2.6 Deficiencies/Needs Summary.....	2-37

3. Future Conditions.....	3-1
3.1 Forecasting Future Traffic Conditions – 1998 to 2025.....	3-1
3.1.1 Study Area Land Use Update	3-2
3.2 Future Traffic Demand – Year 2025	3-2
3.2.1 2025 Daily Volumes	3-3
3.2.2 2025 Peak Hour Volumes	3-3
3.3 Future Traffic Operations – Year 2025	3-5
3.3.1 Mainline Operations	3-5
3.3.2 Ramp Operations	3-7
3.3.3 Weaves	3-9
3.3.4 Intersections.....	3-10
3.3.5 Comparison of Existing and Future Conditions.....	3-16
3.4 Future Demand vs. Capacity	3-18
3.4.1 2025 Demands Exceeding Capacity	3-18
3.4.2 Future Demand vs. the Design Capacity (LOS D)	3-20
3.4.3 Peak Spreading.....	3-21
3.5 Future Deficiencies/Needs Summary – Year 2025	3-23
4. Existing Environmental Conditions.....	4-1
4.1 Constraint Mapping Process	4-1
4.2 Corridor Environmental Constraints.....	4-2
4.2.1 Wetland and Surface Water Resources.....	4-2
4.2.2 Floodplains & Stream Channel Encroachments	4-3
4.2.3 Groundwater Resources	4-5
4.2.4 Historic and Archaeological Resources	4-7
4.2.5 Section 4(f) and Section 6(f) Resources	4-8
4.2.6 Rare, Threatened, and Endangered Species.....	4-9
4.2.7 Farmland Soils	4-10
4.2.8 Oil and Hazardous Materials.....	4-11
5. Mainline Alternatives Analysis	5-1
5.1 Future Demand vs. Capacity	5-1
5.2 Alternatives to Reduce Demands	5-3
5.2.1 Peak Spreading.....	5-3
5.2.2 Alternative Modes	5-5
5.2.3 Diversions to Alternative Routes	5-14
5.3 Alternatives to Increase Capacity	5-14
5.3.1 Approach to Mainline Widening Alternative Analysis	5-15
5.3.2 Locations Warranting Additional I-84 Mainline Capacity	5-15
5.3.3 Engineering Considerations for Widening I-84.....	5-17
5.3.4 Analysis of Mainline Widening Options/Impacts	5-20
5.4 Summary of Mainline Alternatives Analysis.....	5-33

6. Interchange Alternatives Analysis	6-1
6.1 Interchange Alternatives Screening Methodology	6-1
6.1.1 Preliminary Evaluation/Screening of Alternatives	6-1
6.1.2 Refinement of Transportation Alternatives.....	6-2
6.2 Interchange Alternatives Development/ Screening.....	6-5
6.2.1 Exits 1 and 2 (Danbury)	6-5
6.2.2 Exits 3 and 4 (Danbury)	6-9
6.2.3 Exits 5 and 6 (Danbury)	6-14
6.2.4 Exits 7 and 8 (Danbury/Bethel/Brookfield)	6-21
6.2.5 Exit 9 (Newtown/Bethel).....	6-27
6.2.6 Exit 10 (Newtown)	6-30
6.2.7 Exit 11 (Newtown)	6-33
6.3 Summary of Interchange Improvements.....	6-37
6.3.1 Summary of Short-term Interchange Improvements/Costs.....	6-37
6.3.2 Summary of Long-term Interchange Improvements/Costs	6-41
7. Corridor Recommendations and Action Plan.....	7-1
7.1 Overview	7-1
7.2 Summary of Needs/Prioritization of Recommended Actions	7-2
7.3 I-84 Action Plan.....	7-4
7.4 Environmental Considerations	7-14

Tables

Table No.	Description
1-1	I-84 Project Meeting Schedule
2-1	Housatonic Valley Region Demographics/Trip Generation
2-2	I-84 Average Annual Daily Traffic Volumes (AADT)
2-3	I-84 Peak Hour Volumes—Mainline, 1998 Existing Conditions
2-4	Vehicle Classification Study Results
2-5	I-84 On Ramp Locations—Geometric Assessment
2-6	I-84 Off-Ramp Locations—Geometric Assessment
2-7	I-84 Ramp Distances
2-8	Summary of Freeway Segment Analysis, 1998 Existing Conditions
2-9	Ramp Level-of-Service Analysis Summary, 1998 Existing Conditions
2-10	Weaving Sections Level-of-Service Analysis Summary, 1998 Existing Conditions
2-11	Signalized Intersection Level-of-Service Summary, 1998 Existing Conditions
2-12	Unsignalized Intersection Level-of-Service Summary
2-13	Summary of Accident History (SLOSSS List)
2-14	Summary of Accident History (1/10 mile locations)
3-1	I-84 Mainline Average Daily Traffic Volumes (ADT) Comparison — 1998 to 2025
3-2	I-84 Mainline Peak Hour Volume Comparison — 1998 to 2025
3-3	I-84 Peak Hour Volumes – Mainline — 2025 Future Conditions
3-4	Summary of Freeway Segment Analysis — 2025 Future Conditions
3-5	Ramp Level-of-Service Analysis Summary — 2025 Future Conditions
3-6	Weaving Sections Level-of-Service Analysis Summary — 2025 Future Conditions
3-7	Signalized Intersection Level-of-Service Summary — 2025 Future Conditions
3-8	Unsignalized Intersection Level of-Service Summary — 2025 Future Conditions
3-9	Comparison of Existing and Future Study Area Traffic Conditions — 1998 to 2025
3-10	I-84 2025 Forecasted Demand Compared to Capacity
3-11	I-84 2025 Forecasted Demand Compared to LOS D Operations
3-12	Comparative Levels of Service for Freeway Segments (Existing vs. 2025 Conditions)
4-1	Stream Crossings within I-84 Corridor
4-2	Hazardous Materials Database Search Radii
5-1	Comparative LOS for Freeway Segments (Existing vs. 2025 Conditions)
5-2	Summary of TDM Programs in the I-84 Corridor Study Area
5-3	Summary of Park-and-Ride Lots in the I-84 Corridor Study Area

Tables

Table No.	Description
5-4	Identification of Freeway Segments Warranting Added Capacity
5-5	Add-a-Lane Improvement Alternative (Exit 1 to 11)
5-6	I-84 Add-a-Lane Improvement Alternative (Exit 1 to Exit 11)
6-1	Exits 1 and 2 Summary of Deficiencies/Needs and Alternatives Considered
6-2	Exits 3 and 4 Summary of Deficiencies/Needs and Alternatives Considered
6-3	Exits 5 Summary of Deficiencies/Needs and Alternatives Considered
6-4	Exit 6 Summary of Deficiencies/Needs and Alternatives Considered
6-5	Exit 7 Summary of Deficiencies/Needs and Alternatives Considered
6-6	Exit 8 Summary of Deficiencies/Needs and Alternatives Considered
6-7	Exit 9 Summary of Deficiencies/Needs and Alternatives Considered
6-8	Exit 10 Summary of Deficiencies/Needs and Alternatives Considered
6-9	Exit 11 Summary of Deficiencies/Needs and Alternatives Considered
6-10	Summary of Short-term Interchange Improvements and Costs (Exit 1 to 11)
6-11	I-84 Long-term Interchange Improvements (Exit 1 to Exit 11) Conceptual Cost Estimate
7-1	I-84 Exits 1 to 11: Short-term Improvement Program (2000 to 2005) Recommendations Screening/Prioritization
7-2	I-84 Improvement Program: New York State Line to Exit 3 Recommendations Screening/Prioritization
7-3	I-84 Improvement Program: Exit 3 to Exit 7/8 Recommendations Screening/Prioritization
7-4	I-84 Improvement Program: Exit 8 to Housatonic River Recommendations Screening/Prioritization
7-5	I-84 Improvement Program Summary

Figures

Figure No.	Description
1-1	Study Area Map
1-2	Study Process
2-1	I-84 Mainline Hourly Traffic Demand Profile
2-2	Geometric and Safety Deficient Locations
2-3	Mainline/Ramp/Weave Capacity Analysis—Morning Peak Hour
2-4	Mainline/Ramp/Weave Capacity Analysis—Evening Peak Hour
2-5	Intersection Capacity Analysis—Morning Peak Hour
2-6	Intersection Capacity Analysis—Evening Peak Hour
3-1	Mainline/Ramp/Weave Capacity Analysis—Morning Peak Hour 2025 No-Build
3-2	Mainline/Ramp/Weave Capacity Analysis—Evening Peak Hour 2025 No-Build
3-3	Intersection Capacity Analysis—Morning Peak Hour 2025 No-Build
3-4	Intersection Capacity Analysis—Evening Peak Hour 2025 No-Build
4-1	Surface Water Resources
4-2	Ground Water Resources
4-3	Cultural Resources & Hazardous Materials
4-4	Farmland Soils
5-2	Conceptual Typical Sections For Capacity Improvements: 4-lane Section to 6-lane Section
5-3	Conceptual Typical Sections For Capacity Improvements: 6-lane Section to 8-lane Section
5-4	Conceptual Typical Sections For Capacity Improvements: Ramp Facilities
5-5	Schematic of Preferred Mainline Widening Treatment
6-1	Exit 1 Short-Term Improvements
6-2	Exit 2 Short-Term Improvements
6-3	Exit 2 Long-Term Improvements
6-4	Exits 3 and 4 Short-Term Improvements
6-5	Exits 3 and 4 Medium-Term Improvements
6-6	Exits 3 and 4 Long-Term Improvements
6-7	Exit 5 Short-Term Improvements
6-8	Exit 6 Short-Term Improvements
6-9	Exits 5 and 6 Long-Term Improvements
6-10	Exit 7 Short-Term Improvements
6-11	Exit 8 Short-Term Improvements
6-12	Exit 7 Medium-Term Improvements

Figures

Figure No.	Description
6-13	Exit 7 Long-Term Improvements
6-14	Exit 8 Long-Term Improvements
6-15	Exit 9 Short-Term Improvements
6-16	Exit 9 Long-Term Improvements
6-17	Exit 10 Short-Term Improvements
6-18	Exit 10 Long-Term Improvements
6-19	Exit 11 Short-Term Improvements
6-20	Exit 11 Medium-Term Improvements
6-21	Exit 11 Long-Term Improvements