

## TABLE OF CONTENTS

*SR 1, Little Heaven Grade Separated Intersection Project  
Environmental Assessment / Section 4(f) Evaluation*



*U.S. Department of Transportation  
Federal Highway Administration*



*Delaware Department of Transportation*

**TABLE OF CONTENTS**

	<b><u>Page</u></b>
<b>SUMMARY</b> .....	S-1
<b>TABLE OF CONTENTS</b> .....	i
List of Tables .....	iv
List of Figures .....	v
Appendices.....	vi
<b>I. PROJECT PURPOSE AND NEED</b> .....	<b>I-1</b>
A. Project Location .....	I-1
B. Project Purpose .....	I-3
C. Project Need.....	I-3
1. Traffic Safety .....	I-3
2. Preserve Roadway Capacity for Current and Future Traffic .....	I-5
D. Proposed Action.....	I-11
<b>II. ALTERNATIVES CONSIDERED</b> .....	<b>II-1</b>
A. Project History and Public Involvement .....	II-1
B. Description of Alternatives .....	II-2
1. Typical Cross Section for the Build Alternatives .....	II-2
2. Description of Build Alternatives .....	II-3
a. Alternative A.....	II-3
b. Alternative B.....	II-3
c. Alternative C (Preferred Alternative).....	II-4
d. Alternative D.....	II-4
e. Alternative E .....	II-5
f. Alternative F .....	II-5
C. Multi-modal Opportunities .....	II-5
D. Selection of the Preferred Alternative.....	II-12
1. Alternatives Not Selected as the Preferred Alternative.....	II-14
2. Alternative C- The Preferred Alternative .....	II-14

**TABLE OF CONTENTS (cont'd)**

	<b><u>Page</u></b>
<b>III. IMPACTS .....</b>	<b>III-1</b>
<b>A. Socio-Economic Environment .....</b>	<b>III-1</b>
1. Neighborhoods and Communities.....	III-3
2. Relocations.....	III-5
3. Environmental Justice Communities .....	III-5
a. Low Income Population .....	III-6
b. Minority Population .....	III-6
4. Land Use/Land Cover .....	III-10
a. Existing Land Use/Land Cover .....	III-10
b. Future Land Use/Land Cover.....	III-10
c. Livable Delaware Initiative.....	III-13
d. Land Use/Land Cover Impacts .....	III-13
5. Agricultural Preservation .....	III-15
6. Community Institutions, Facilities and Services .....	III-15
a. Schools and Libraries.....	III-15
b. Churches and Cemeteries.....	III-15
c. Parklands and Recreational Facilities .....	III-15
d. Health Care Facilities.....	III-15
e. Emergency Services and Law Enforcement .....	III-18
f. Public Utilities .....	III-18
g. Independent Utilities.....	III-18
h. Multi-modal Transportation Facilities and Services.....	III-18
<b>B. Cultural Resources .....</b>	<b>III-19</b>
1. Methodology.....	III-19
2. Archaeological Resources.....	III-19
a. Impacts to Archaeological Resources .....	III-20
3. Historic Architectural Resources .....	III-23
a. Impacts to Historic Resources.....	III-23
<b>C. Natural Environment.....</b>	<b>III-25</b>
1. Open Waters and Wetlands: USACE and DNREC Jurisdictional Resources .....	III-25
a. History of Project-level Open Water and Wetland Delineation.....	III-25
2. Jurisdictional Open Waters .....	III-26
a. Impacts and Avoidance/Minimization Efforts .....	III-26
3. Jurisdictional Wetlands.....	III-28
a. Impacts and Avoidance/Minimization Efforts .....	III-29
(1) No Build.....	III-29
(2) Alternative Analysis .....	III-29
b. Wetland Mitigation.....	III-31
c. Wetland Permits .....	III-32
4. Floodplains.....	III-32
5. Threatened and Endangered Species .....	III-32

**TABLE OF CONTENTS (cont'd)**

	<b><u>Page</u></b>
6. Air Quality .....	III-32
a. Air Quality Impacts .....	III-34
7. Noise .....	III-34
a. Noise Fundamentals .....	III-34
b. Noise Abatement Criteria .....	III-34
c. Data Collection .....	III-35
d. Model Calibration .....	III-38
e. Existing Noise Levels .....	III-38
f. Design Year 2030 Noise Environment .....	III-38
g. Impact Assessment and Mitigation .....	III-38
h. Construction Noise .....	III-40
8. Hazardous Materials .....	III-40
<b>IV. SECTION 4(f) EVALUATION .....</b>	<b>IV-1</b>
A. Introduction and Methodology .....	IV-1
B. Project Action .....	IV-2
C. Description of Section 4(f) Properties .....	IV-3
1. Barratt's Chapel and Cemetery (CRS # K-103) .....	IV-5
2. Thomas James House (CRS # K-2686) .....	IV-6
3. Mt. Olive Colored School/Mt. Olive School (CRS # 2685) .....	IV-7
D. Impacts to Section 4(f) Properties .....	IV-9
1. Barratt's Chapel and Cemetery (CRS # K-103) .....	IV-10
2. Thomas James House (CRS # K-2686) .....	IV-12
3. Mt. Olive Colored School/Mt. Olive School (CRS # 2685) .....	IV-14
E. Avoidance Alternatives .....	IV-16
1. No-Build Alternative .....	IV-16
2. Avoidance Alternative for Preferred Alternative C .....	IV-18
F. Options to Minimize Harm, Prevent Harm and Provide Mitigation .....	IV-20
G. Consultation and Coordination .....	IV-21
H. Conclusion .....	IV-22
<b>V. AGENCY AND PUBLIC COORDINATION .....</b>	<b>V-1</b>
A. Agency Coordination .....	V-1
B. Public and Community Involvement .....	V-1
1. Public Workshops .....	V-1
2. Project Website .....	V-2
3. Other Public Involvement Efforts .....	V-3
4. References .....	V-3
<b>VI. APPENDICES .....</b>	<b>VI-1</b>
A. Memorandum of Agreement Regarding Implementation of the Little Heaven Grade Separated Intersection .....	VI-1
B. Agency Correspondence .....	VI-14

**LIST OF TABLES**

<b><u>Table</u></b>	<b><u>Page</u></b>
I-1	SR 1 Accident Data..... I-4
I-2	SR 1, Little Heaven Grade Separated Intersection: AADT for Existing Roadways ..... I-5
I-3	Weekday Peak Hour LOS for SR 1 at Mulberrie Point Road Intersection..... I-6
I-4	Weekday Peak Hour LOS for Clapham Road at Mulberrie Point Road Intersection..... I-7
I-5	Weekday Peak Hour LOS for SR 1 and Clapham Road Intersection..... I-8
I-6	Weekday Peak Hour LOS for SR 1 and North Skeeter Neck Road Intersection ..... I-8
I-7	Weekday Peak Hour LOS for SR 1 and Bower’s Beach Road Intersection..... I-9
I-8	Weekday Peak Hour LOS for SR 1 and South Skeeter Neck Road Intersection ..... I-9
I-9	Weekday Peak Hour LOS for SR 1 and Barratt’s Chapel Road Intersection..... I-10
II-1	Alternatives Analysis ..... II-12
II-2	Summary of Impacts for All Alternatives..... II-13
III-1	Population and Housing Characteristics for Delaware, Kent County and the Project Area ..... III-1
III-2	Properties Affected under Each of the Build Alternatives..... III-5
III-3	Project Area Census Block Groups by Number of Persons at or Below the Poverty Level ..... III-6
III-4	Project Area Census Block Groups Ranked by Total Minority Population ..... III-7
III-5	High Point Community Census Block Groups ..... III-9
III-6	Existing Land Use/Land Cover in the Project Area..... III-10
III-7	Future Land Use/Land Cover in the Project Area ..... III-10
III-8	Potential Prehistoric and Historic Archeological Resources in the APE..... III-21
III-9	Key to CRS Numbers for Archeological Resources in APE and Surrounding Project Area ..... III-21
III-10	Surveyed Historic Architectural Resources in the APE ..... III-23
III-11	Impacts to Jurisdictional Open Waters in Linear Feet (LF) ..... III-26
III-12	Summary of Wetland Characteristics ..... III-28
III-13	Individual Wetlands: Impacts in Acres (ac.)..... III-29
III-14	Noise Abatement Criteria ..... III-35
III-15	Field Measured Noise (Leq) in the Project Area ..... III-36
IV-1	Section 4(f) Resource Impacts by Alternative (in Acres)..... IV-9

**LIST OF FIGURES**

<b><u>Figure</u></b>		<b><u>Page</u></b>
I-1	Project Location Map.....	I-1
I-2	Project Area Map .....	I-2
I-3	Examples of Uncontrolled Access along SR 1 in the Little Heaven Area.....	I-4
II-1	Typical Section for Proposed Build Alternatives .....	II-2
II-2	Alternative A.....	II-6
II-3	Alternative B .....	II-7
II-4	Alternative C (Preferred Alternative) .....	II-8
II-5	Alternative D.....	II-9
II-6	Alternative E .....	II-10
II-7	Alternative F .....	II-11
III-1	Census Blocks.....	III-2
III-2	Neighborhoods and Communities.....	III-4
III-3	Environmental Justice.....	III-8
III-4	Existing Land Use.....	III-11
III-5	Future Land Use.....	III-12
III-6	Livable Delaware .....	III-14
III-7	Agricultural Preservation .....	III-16
III-8	Community Facilities.....	III-17
III-9	Archeological Area of Potential Effect (APE).....	III-22
III-10	Historic Architectural Resources in the APE.....	III-24
III-11	Jurisdictional Open Waters and Wetlands .....	III-27
III-12	Floodplains.....	III-33
III-13	Noise Sensitive Areas .....	III-37
III-14	Noise Impacts for 2004 No-Build and 2030 No-Build and Build .....	III-39
IV-1	Historic Resources .....	IV-4
IV-2	Barratt’s Chapel and Cemetery (CRS # K-103) .....	IV-5
IV-3	Thomas James House (CRS # K-2686) .....	IV-6
IV-4	Mt. Olive School / Mt. Olive Colored School (CRS # K-2685).....	IV-8
IV-5	Barratt’s Chapel and Cemetery Minimization .....	IV-11
IV-6	Thomas James House Minimization .....	IV-13
IV-7	Preferred Alternative C in the Vicinity of the Mt. Olive School .....	IV-15
IV-8	No-Build Alternative in the Vicinity of the Mt. Olive School .....	IV-17
IV-9	Avoidance Alternative in the Vicinity of the Mt. Olive School .....	IV-19