INTRODUCTION

Delaware 8 is an important local and regional corridor for Delaware. Within the City of Dover limits it serves as the major western gateway into the City. In 1992, the City adopted a Corridor Overlay Zone on Del. 8 to address both aesthetic and functional aspects of the roadway. In 2000, the Strategic Development Plan for the West Side report was prepared which identified strategies to improve the corridor.

The purpose of this project is to conduct a planning level study of Delaware Route 8 that will develop a concept of the corridor as an aesthetic gateway to the west side of Dover and address the need to provide a safe and efficient traffic flow, accommodate multiple modes of travel and provide access to the adjacent land uses. In addition, the concept plan will evaluate land use issues in order to develop strategies to guide future transportation and land use decisions.

PROJECT UNDERSTANDING

Delaware 8 is a minor arterial roadway that, as part of the National Highway System, serves as the primary route into Dover from western Kent County and portions of Maryland (including the primary connection to US 301). Within the study area, the character of the highway varies from a country road to an urban street. Land use along the corridor is a mix of residential and commercial uses. The following table details the speed limits, traffic volumes (based on the 2004 DelDOT traffic summary), cross-sectional elements and land use within the corridor.

Section	Speed Limit	Traffic Volume	Cross Section	Pedestrian	Land Use
Artis Dr. to Mifflin Rd	50 mph	11,100 aadt	1 - WB shoulder 1 - WB travel lane 1 – EB travel lane 1 – EB shoulder	No sidewalk	Farmland/Residential
Mifflin Rd to Kenton Rd	50 mph	11,600 aadt	1 - WB shoulder 1 - WB travel lane 2 – EB travel lanes	No sidewalk	Residential
Kenton Road to Del. 15	35 – 40 mph	15,500 aadt	2 – WB travel lanes 1 – Center turn lane 2 – EB travel lanes	S/W on both sides (one hot mix; one concrete)	Commercial
Del 15 to Gibbs Dr.	25 mph	20,234 aadt	2 – WB travel lanes 1 – Center turn lane 2 – EB travel lanes	S/W on both sides	Commercial/ Residential
Gibbs Dr. to Delmarva RR line	25 mph	11,200 aadt	Transitions from 4 lane section to 2 lane section with shoulders	S/W on both sides	Commercial/ Residential/ Institutional (school)

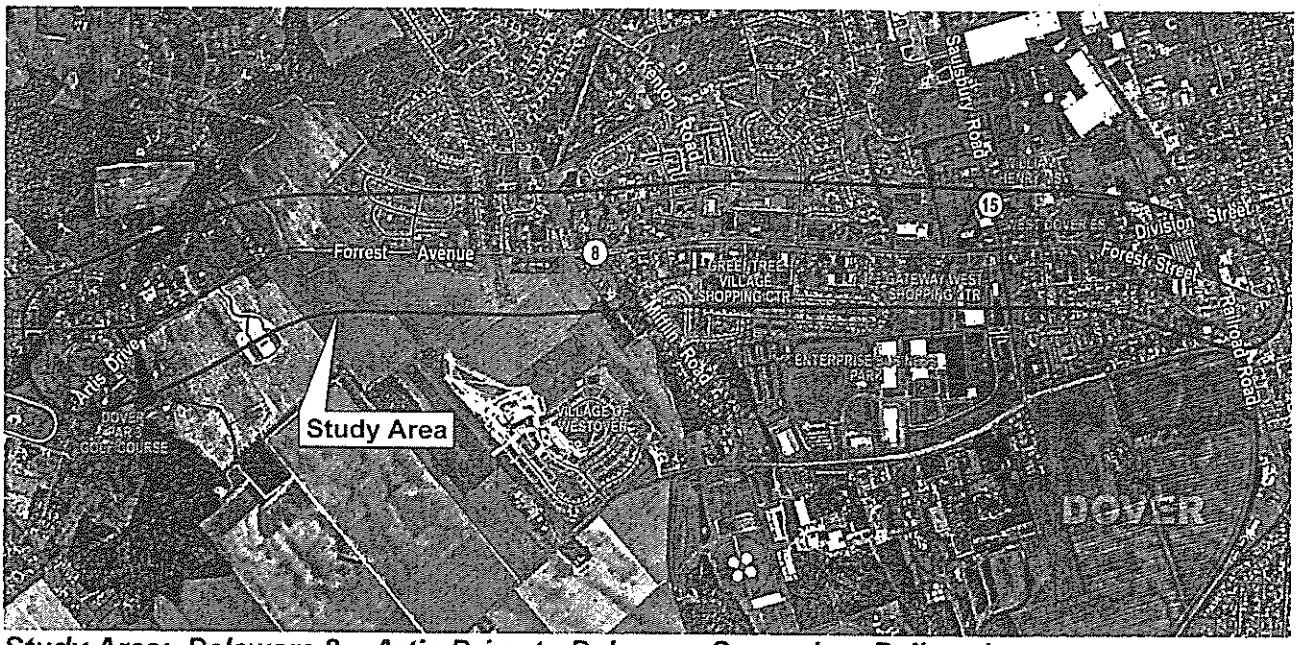
JMT will perform analysis of both existing and future conditions. Alternative solutions will be developed that will address capacity, safety, and multi-modal deficiencies. The alternatives analysis will include evaluating the transportation impact of alternative land use scenarios within

the study area using standard trip generation and distribution methodologies. JMT will also perform a preliminary screening of cultural and environmental resources within the project area.

JMT will develop a maximum of three (3) concept level alternatives for evaluation by the D/KC MPO and the advisory committee. JMT will also produce a technical report describing the environmental and traffic impacts for each alternative. The report will also include recommendations for further actions, such as early action contracts.

Our scope of work has been developed in accordance with the Request for Proposal "Delaware 8 Concept Plan and Operations Study", issued March 24, 2006. The following tasks will be performed as part of this study:

- Existing/Base Conditions
  - Traffic Data
  - Transit Ridership Data
  - Crash Data
  - Environmental Resources
  - Cultural Resources
  - Land use inventory
- Traffic Analysis
  - Synchro Model
  - Safety Analysis
  - Land Use Analysis
  - Potential Development/Re-development Areas
- Purpose and Need Statement
- Concepts/Alternatives Development and Analysis
  - Preliminary Cost Estimates
  - Alternative Analysis and Impacts Matrix
- Project Technical Memorandum
- Coordination Meetings and Public Involvement



Study Area: Delaware 8 – Artis Drive to Delmarva Secondary Railroad

TECHNICAL APPROACH

JMT's technical approach has been organized consistent with the tasks identified in the RFP.

TASK 1 – PURPOSE OF STUDY

JMT will provide a background description of the corridor including, its importance in providing access from western Kent County into Dover, as well as a commercial corridor for the west side of Dover.

Following the analysis of the existing conditions, JMT will assist in developing a general Purpose and Need Statement for the project. This draft statement will be submitted to the D/KC MPO for approval and will serve as the criterion for comparison of the developed alternatives as to whether each meets the purpose and need of the project. JMT will utilize the traffic analysis in preparing the general Purpose and Need Statement.

TASK 2 – ANALYSIS OF EXISTING CONDITIONS

I. Base Conditions

JMT will utilize existing GIS base mapping and data for use in this project. Any right-of-way, topographic and detail mapping provided by third parties will be used for a planning level analysis.

A. Data Assemblage

JMT will coordinate with the Dover/Kent County MPO, Kent County, the City of Dover and DelDOT to obtain, in both hardcopy and digital, available data, information and studies for use with the project. The Dover/Kent County MPO will obtain as much of this data as possible prior to the beginning of the study. This includes assembling data and information, securing licensing agreements, obtaining digital product specifications and metadata and reviewing existing studies. It is anticipated that JMT will collect and assemble the following data and information:

- Orthophotography
- City/County Land Use and Comprehensive Plans
- Land Use and Zoning Maps
- Tax Maps
- National Wetland Inventory (NWI) Maps
- Historic Inventory
- Rare, threatened and endangered species information
- Previously prepared environmental documents and studies (if available)
- Proposed development plans
- As built roadway construction plans

- Transit routes and ridership data
- Pedestrian/bicycle facilities mapping and plans
- Existing traffic counts, data and studies
- Crash reports and HSIP studies

The above data provides the basis for conducting the concept development and alternative analysis. Most of this information will be obtained from the DelDOT, the City of Dover, and Kent County.

B. Data Collection

JMT will conduct field visits of the area to identify the corridor's physical constraints and to document specific issues that could affect the concept development and alternative selection. Photographs will be taken and a photo inventory will be compiled for future reference and possible implementation into project graphics.

C. Data Conversion

The pertinent plan data will be incorporated onto the base mapping to create a composite map or series of composite maps. All data collected and assembled will be converted into a common format for the purpose of evaluating the existing conditions, proposed development and analysis of the alternatives. JMT will be prepared to provide all data in accordance to the D/KCMPO's GIS data specifications.

II. Environmental and Cultural Resource Inventory

A preliminary environmental inventory of the study area will be conducted to provide sufficient information necessary to compare the environmental consequences of each alternative. This environmental inventory will be prepared using existing natural resources data.

JMT will incorporate the environmental data into Environmental Inventory Maps, which will be used for the assessment and cost/benefit analysis of the various alternatives. Permits for each proposed alternative will be identified. The environmental analysis of the alternatives will include a discussion and assessment of the following resources:

A. Cultural Resources

The State Historic Preservation Office will be contacted regarding the known presence of historically significant features or archeological resources within the project vicinity. Our initial review of the project area indicates that there are no known historic resources within the study area. However, a preliminary screening will be conducted by our sub-consultant AD Marble and Company that will assess the known historic architectural resources within the proposed project limits. The

locations of these resources will be ascertained and included on the Environmental Inventory mapping.

B. Socio-Economic Analysis

JMT will identify potential consequences associated with disturbances to the land use and socio-economic components of the community.

JMT will gather information on all potential socio-economic resources located within the project area. Sources of information may include:

- Dover/Kent County MPO
- USGS topographic maps
- US Census Data
- Land Use and Zoning Information
- Aerial photographs
- The City of Dover Comprehensive Plan.
- Kent County Comprehensive Plan

As part of gathering background data, JMT will review the 1990 and 2000 US Census data and consult local community planners to describe population, race, income, and number of households in the study area, and determine if there are any Environmental Justice communities within the study area. Any impacts to these communities will be noted on the impact matrix.

C. Rare, Threatened and Endangered Species

Letters of inquiry will be sent to the U.S. Fish & Wildlife Service (USFWS) and the Departement of Natural Resources and Environmental Control (DNREC) regarding the known presence of rare, threatened or endangered species (RTE's) and fisheries habitat in the vicinity of the project site. This correspondence will also provide information on rare and unique habitats that may occur in the vicinity of the project. JMT environmental specialists will map all unique and sensitive natural features within the project area that have been identified. JMT has not included within our proposal any effort required to field identify or evaluate any RTE's listed as potential resources.

D. Waters, Wetlands and Floodplains

JMT will conduct a review of the available data to provide information on the location and extent of waters, wetlands and floodplains that may be affected by the proposed alternatives. The National Wetlands Inventory (NWI) mapping will be used to identify mapped wetlands and streams.

E. Hazardous Waste/Materials

An internet database search of the area will be conducted to identify the location and nature of known hazardous waste and hazardous material sites. JMT will document the potential presence or absence of contaminated and/or hazardous substances within the project study area, and the likelihood for adverse environmental impacts from activities on adjacent properties.

H. Environmental Inventory Memorandum

A memorandum will be prepared detailing the environmental data collection effort and containing data utilized for the study. This memorandum will not include an assessment of impacts; the impact assessment will be included in the Alternatives Analysis.

This scope and cost estimate assumes that detailed air and noise analysis will not be necessary as part of this stage of the feasibility study. Detailed air quality and noise analyses are anticipated during a detailed alternatives analysis. This scope does not include the delineation of waters of the U.S. or wetlands beyond currently available maps. Permitting is not included in this scope.

III. Traffic Analysis

A. Gather Traffic Data

A review of the DelDOT Traffic Summary shows that traffic volumes along the corridor vary from 11,100 aadt at the west end to 20,600 aadt east of Del. 15. It is noted that some traffic counts conducted along the Del. 8 have not been updated since 2000 and may not reflect actual conditions.

Traffic count data will be gathered. Specifically, turning movement counts will be done at the following intersections. They are:

- Del 8/Mifflen Road
- Del 8/Kenton Road
- Del 8/Independence Way
- Del 8/Saulsbury Road (SR 15)
- Del 8/Gibbs Drive
- Del 8/Forrest St.

The intersection of Del. 8 and Ridgley St. will not be counted. The turning movement volumes will be interpolated using the counts from Del. 8 and Forrest St. and the 2004 counts from Century Engineering.

The manual turning movement counts will take place in the AM and PM peak periods from 6:30-9:00 AM and 4:00-6:30 PM. In addition to the manual counts, one portable counts will be performed west of Heatherfield. These counts will be

conducted to gather average daily traffic data and truck classification data. JMT has a full staff of traffic counters and equipment to perform the counts. An existing traffic diagram will be developed from the count data.

B. Analysis of Existing Conditions

A level of service analysis will be performed at each of the signalized intersections for the existing conditions.

IV. Safety Review and Analysis

JMT will gather crash reports from DelDOT covering a three year period. In addition, JMT will gather any HSIP (Highway Safety Improvement Program) studies that have been performed along the corridor.

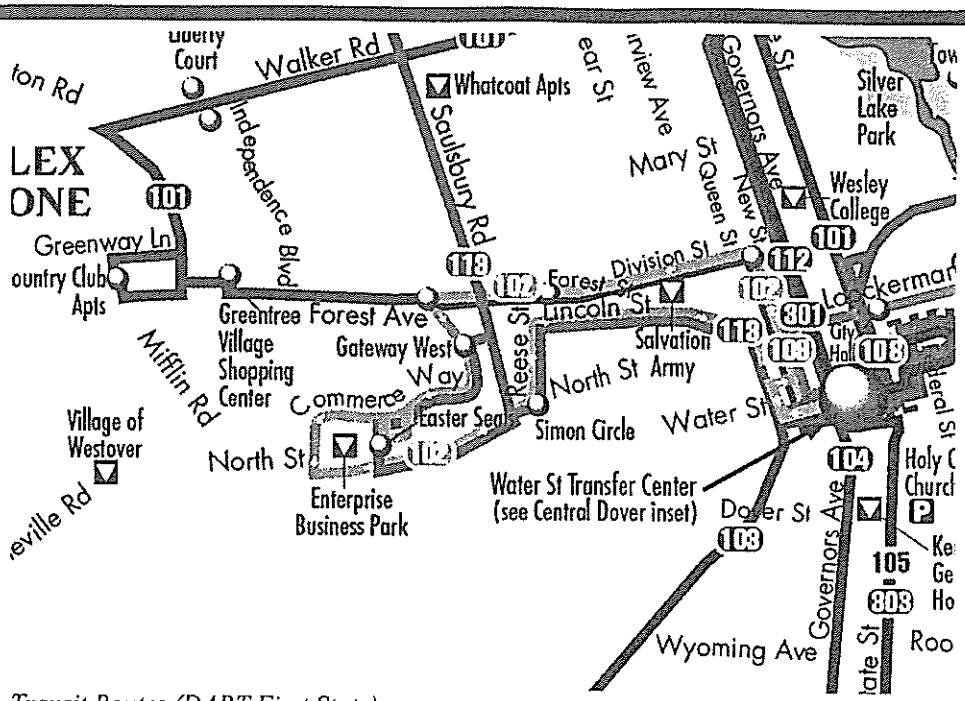
Crash diagrams will be prepared for each cluster of crash locations detailing the type and conditions for each crash. JMT will analyze the cluster locations to determine the root cause of accidents in these areas. Alternatives will be developed to mitigate the cause of the crashes.

V. Transit, Pedestrian and Bicycle Facilities

JMT will inventory the existing transit, pedestrian and bicycle facilities and gaps in ADA compliance.

Currently three bus routes traverse the Del. 8 corridor. They are Route 101, 102 and 113. Ridership data will be gathered for each transit stop. Based on the ridership, recommendations will be made whether a shelter or bus pad should be provided.

The existence and condition of pedestrian and bicycle facilities will also be evaluated. It is noted that sidewalks are generally provided on both sides of SR 8 from Mifflin Road to the east end of the study area. There are no bicycle facilities designated along the corridor.



Transit Routes (DART First State)

VI. Land Use

Land use along the corridor is a mix of residential and commercial uses. As growth on the western side of Dover has occurred, development along the highway has evolved from individual residential homes; to a conversion of these homes to small business; to the current practice of assembling multiple smaller parcels and redeveloping them with larger commercial establishments. JMT will conduct an inventory of the existing land use and review the planned land use in the study area. Any proposed development reports will be gathered. This planned, proposed, and approved development will be compared to the growth assumed in the regional model.

Existing Land Use (City of Dover) April 13, 2006

It is noted that the existing farmland located between Artis Drive and Mifflin Road on the south side of DE 8 has been designated by the City of Dover as desirable for annexation. The potential for development of this land will be incorporated into the analysis. The potential for development on the north side of DE 8 will be discussed with Kent County.

TASK 3 – ANALYSIS OF FUTURE CONDITIONS

I. Traffic Analysis

A. Develop Travel Demand Forecasts

Travel demand forecasts will be developed for the project. These forecasts will be based on the DelDOT regional model. The base year model volumes will be compared to existing ground counts. Adjustments will be made to the model as necessary. Based upon our master plan and development review, the 2030 model runs will be performed. Refinements to the model runs will be conducted to produce the 2030 average daily traffic and AM/PM peak hour volumes. Manual adjustments will be made to reflect the various alternatives.

B. Perform Traffic Analysis

A level of service analysis will be performed for both the existing and future conditions. The analysis will include the various intersections within the study area. This will include any roundabout analysis using the SIDRA model. A traffic report will be prepared and submitted to the D/KCMPO listing all data,

assumptions, traffic forecasts and results of the capacity and safety analysis.

II. Land Use

The corridor is characterized by recent commercial redevelopment of former commercial or residential parcels between Mifflin Road and Saulsbury Road. This pattern is anticipated to continue throughout this portion of the corridor. The Moose Lodge property is the largest parcel which is currently for sale.

In accordance with the City of Dover's Comprehensive Plan, the land use analysis will assume residential development of the farmland at the west end of the study area that has been identified as "desirable for annexation" by the City of Dover.

JMT will identify undeveloped parcels along the corridor and will analyze the transportation impact of a higher density urban style development of these parcels.

TASK 4 – PRESENTATION OF MITIGATION STRATEGIES

JMT will analyze a maximum of three (3) alternatives. The alternatives will be developed conceptually to determine if any fatal flaws are present. Guided by the data and information collected as described above, JMT will analyze up to three proposed concepts, two build alternatives and one no-build alternative, to study and develop recommendations. From these, one alternative will be proposed as the preferred alternative. The alternatives will include provisions for transit, pedestrians and bicyclists and detail aesthetic improvements. The following components are anticipated:

A. Preliminary Analysis

JMT will review all data gathered to perform an analysis of existing conditions. The composite maps will provide a description of existing conditions as well as indicate planned improvements. The composites will be used to identify constraints and deficiencies within the project area and will provide the basis for the identification and assessment of conceptual alternatives for alignment. .

B. Alternative Development

1. Design Criteria

Design guidelines will be established for the project based on DelDOT and AASHTO guidelines. These criteria will be established based on design speeds and traffic volumes. A technical memorandum documenting the design criteria will be prepared.

2. Typical Sections

JMT will develop typical sections for proposed alternatives based on the project's design criteria. These sections will specify roadway elements including lane, shoulder, median and sidewalk widths, and streetscape elements where appropriate. The typical sections will be used for analyses of potential impacts. JMT will provide a graphic display of the typical section.

3. Plan Views

JMT will develop plan views for each of the proposed alternatives. These plan views will illustrate lane assignments, medians, curbs, sidewalk, bicycle lanes, landscaping, existing and proposed right of way for proposed alternatives based on the project's design criteria.

C. Preliminary Cost Estimates

JMT will develop planning level cost estimates for each of the build alternatives.

D. Alternative Analysis and Impacts Matrix

JMT will conduct an alternative analysis utilizing an impact assessment model taking into consideration NEPA requirements. The following items will be assessed for each alternative:

Traffic and Safety
- Intersection and highway link levels of service
- Delay at various intersections
- Crash experience

Cultural, Social and Natural Environment
- Number of properties affected (displacements and proximity impacts for existing and proposed development)
- Public parkland impacts
- Community impacts
- Wetland and buffer impacts
- Historic/Archeological resource impacts
- Rare, threatened and endangered species impacts
- Environmental Justice issues

Planning and Economics
- Accessibility to jobs
- Consistency with local comprehensive plans
- Land use impacts (location and intensity)
- Project Cost

JMT will develop an alternatives comparison and impacts matrix based on the results of

the engineering, traffic and environmental analysis.

TASK 5 – VISUALIZATION

In presenting a concept plan to citizens and elected and other agency officials, it is important to provide clear and readily understood graphic representations. JMT is committed to developing the latest state of the art graphics utilizing our in-house graphic artists in conjunction with the latest computer software programs. Depending on the project, artist's renderings and/or computer manipulated images may be used. Additionally, we also have completed 3-D "drive through" computer simulations of proposed roadway improvements for public meetings.

For this project, we believe several techniques will be appropriate. Aerial mapping will provide the base map for both the existing and proposed conditions. Computer generated images of the proposed alternatives at several sections of the road will provide a clear illustration of the proposed improvement.

JMT will use SimTraffic for simulation of the existing and future traffic operations, CORSIM will be used for simulation of any roundabout alternative. The simulation models will demonstrate traffic patterns and highlight any problems associated with the existing or proposed conditions.

TASK 6 - MEETINGS

Public involvement and outreach for this project will involve development of an oversight (or Project Advisory Committee) committee which will include residents, business owners, agency representatives and elected officials.

A mailing list will be developed by the MPO. It is anticipated that JMT will use the list to communicate with the oversight committee. Every effort will be made to communicate predominantly electronically. Anything that has to be sent via postal service or UPS will be sent by the MPO. The MPO office will maintain the master list. At some point the MPO may develop a newsletter style email distribution list which can be used for disseminating information.

JMT will be responsible for meeting with property owners and other stakeholders.

If the MPO has the opportunity to develop a newsletter or web site dedicated to the project, JMT will provide graphics, data and possibly text for the MPO staff to use to assemble the newsletter or set up the web site.

JMT will assume that it will be necessary to attend five (5) meetings for the Project Advisory Committee. Handouts relevant to each meeting will be developed. Meeting minutes will be prepared for all meetings.

Meeting #1 – A kickoff meeting will be held to discuss the goals of the project, the role of the Public Advisory Committee and the process the study will follow.

Meeting #2 – At this meeting, JMT will present the results of the data collection and analysis of existing and future no-build conditions. Corridor deficiencies will be identified. The PAC will be asked to confirm the needs that have been identified and help develop potential alternatives to address the problems. Also, undeveloped parcels will be identified. JMT will seek input on the development scenarios that should be evaluated for these parcels.

Public Workshop #1 – All the base data including land use, environmental conditions, multi-modal facilities and traffic volumes, will be presented at this workshop. In addition, the analysis of existing and future no build conditions will be presented. This will include level of service analysis and safety analysis. The goal of this meeting is to explain the goal of the project, confirm that existing problems have been identified, and solicit input on potential alternatives.

Meeting #3 – At this meeting, JMT will review the results of the public workshop and present draft alternatives for review by the working group. This information will include a LOS analysis of the alternatives. At this meeting, the PAC will be asked to comment on the alternatives in order that they can be refined and presented at a Public Workshop. The PAC will also be asked to identify a preferred alternative.

Public Workshop #2 – At this workshop, JMT will present alternatives that address the needs identified at the previous workshop. One of the alternatives will be identified as a preferred alternative. Comments on these alternatives will be collected and reviewed.

Meeting #4 – The results of the public workshop will be discussed as well as any refinements to the alternatives. Following this meeting refinements to the concept plan will be made and posted on the D/KC MPO's website.

Public Workshop #3 – This workshop will be held if the preferred alternatives presented in at the second workshop are deemed unacceptable by the majority of the people attending that workshop. At this workshop, a new preferred alternative will be presented, which will be based on feedback from the PAC and the second workshop.

Meeting #5 – At this meeting, if needed, JMT will present any refinements to the PAC, and identify outstanding issues that will need to be addressed in future phases of project development.

JMT has anticipated two meetings with the public to inform interested citizens of the project purpose and need, and to present corridor deficiencies, and solicit input on alternatives. The second meeting will present the alternatives. A third meeting will be held only if the second meeting does not result in a preferred alternative.

TASK 7 – RECOMMENDATIONS

JMT will prepare its recommendations in the form of a Technical Memorandum. This report will provide written documentation of the research, development and findings of previously described stages of study. The report will include the following sections:

- Executive Summary
- Purpose of Study
  - Include Purpose and Need Statement
- Analysis of Existing Conditions
  - Include base mapping
  - Identification of current corridor needs
- Analysis of Future Conditions
  - Identification of future corridor needs
- Presentation of Mitigation Strategies
  - Development and analysis of alternatives
- Visualization
  - Mapping and graphics will be incorporated throughout the technical memorandum
- Public Involvement
  - The results of the public outreach project will be summarized.
- Recommendations
  - A preferred alternative will be recommended
  - A list of "early action" contracts will be developed

In collaboration with the D/KC MPO and the oversight committee, JMT will develop a preferred alternative that addresses traffic operations and/or capacity needs, promote multi-modal choices, improves the aesthetics of the corridor ands incorporates the goals of the City's Comprehensive Plan. Strategies will be discussed to integrate the concept plan with local land use decision making, develop a list of early action contracts to be submitted to DelDOT. Specifically, the Technical Memorandum will include the following items;

- Traffic Analysis – Experienced traffic engineers will gather and document the existing traffic conditions and use the DelDOT traffic model to develop design year traffic used for the alternatives. A SYNCHRO traffic model will be developed to analyze both the existing and future conditions including alternatives. The model will be updated to include all approved development.

- Land Use – Existing and planned land uses will be considered in the development of the alternative alignments study as well as the required traffic analysis and identifying the most appropriate concepts for access.

- Environment – Every effort will be made to cost effectively identify the existing environmental features. Development of the alternatives will be guided by the

need to avoid or minimize impacts to sensitive resources and the permits or approvals required by impacting any such resources.

- Cultural – Cultural resources will be addressed as part of the environmental documentation process and in the development of the alternatives. Avoidance or minimization of impacts to sensitive cultural resources is a key aspect of alternative development.

- Design and Construction – Projects will be recommended that can be designed, permitted and constructed. Consultation with elected officials the State and Federal resource agencies will be documented for inclusion in the NEPA process.

- Estimated Cost of Each Alternative – Cost estimates are provided as a routine part of alternative development. Cost information is essential for the elected official to make informed decisions regarding the selection of the alternative to be designed and constructed as well as identification of the project features that should be modified to reduce the project cost.

LIST OF DELIVERABLES

JMT anticipates the following deliverables to be submitted to the D/KCMPO for review and comment:

- Composite map of existing base data including environmental/cultural resources
- Traffic report documenting the findings of the traffic analysis
- Draft Purpose and Need Statement
- Concept plans for three alternatives (2 build and 1 no-build)
- Graphic display of typical sections
- Alternative Impacts Matrix
- Letter report summarizing results of the land use analysis
- Technical memorandum (Draft and Final Reports)
- Handouts and meeting minutes for coordination meetings as required
- Graphic displays, text boards and brochure for Public Meetings
- Summary of comments from Public Meetings

Text documents will be provided in MS Word and Adobe (.pdf) format. Tables will be provided in MS Excel file format. Databases for analysis tools such as HCS, SYNCHRO, CORSIM, SIMTraffic, or SIDRA will be provided in a format that will allow the MPO or DelDOT to run the analysis in house. Databases, shape files and other file types used for GIS will be provided in ArcGIS 9.0.

Based upon our past experiences, a planning schedule may depend upon numerous variables. These variables may include: availability of existing data, coordination with other projects, season related constraints (i.e., traffic counts and environmental identification), public inclusion, available funding, political influences, and several others. JMT will work with the Dover/Kent County MPO to complete the study in a timely manner that meets its needs. A study of this nature will typically range from 6 months to over 18 months to complete. On the following page is a preliminary schedule to initiate discussions. It outlines the completion of the study in approximately 12 months. JMT has the capabilities to "fast-track" the schedule in conjunction with the MPO, if requested.