WS
10-29-02

City of Alexandria, Virginia

MEMORANDUM

DATE: NOVEMBER 19, 2002

TO: THE HONORABLE MAYOR AND MEMBERS OF CITY COUNCIL

THROUGH: PHILIP SUNDERLAND, CITY MANAGER PS

FROM: RICHARD BAIER, DIRECTOR, T&ES RBaier

SUBJECT: QUESTIONS REGARDING EISENHOWER-TO-DUKE ROADWAY

Attached are responses to questions posed by Vice Mayor Cleveland and Council Members Eberwein, Euille and Woodson regarding the Eisenhower-to-Duke roadway. Although the study of this roadway has been deferred, we still wanted to get these answers to you.

Attachments

cc: Michele Evans, Assistant City Manager
Tom Culpepper, Deputy Director, T&ES

Answers to Questions from Jeff Bernholz, Chair, Holmes Run Committee
Referred by Vice Mayor Cleveland and Councilwoman Woodson

Question 1: I ask that documentation of Alexandria's agreement with VDOT and the "inquiry"(letter?) be included as part of the Staff Report on the Connector.

Response: There is no specific "agreement" with VDOT that was entered into for the Clermont Interchange Project. The repayment obligation is based on program requirements for use of urban highway construction funds, which entitle the state and federal government to recover expenditures for projects that are canceled by a local jurisdiction. The state and/or federal government can waive this repayment obligation; however, neither has done so at this time.

The "inquiry" triggering reconsideration of the preferred alternate that was selected in 1993 resulting from a VDOT contact as to the Six-Year Plan and why the City had not fulfilled the commitment on the second phase of the project (the Eisenhower to Duke segment).

Question 2: What projections for development in west Eisenhower Valley were used, what was their source, and how do (will) they fit into the Planning Department's yet to be developed plans?

Response: Development for west Eisenhower Valley were those provided by the City to the Council of Governments (COG) Round 6.1 Cooperative Land Use Projections. The Round 6.1 projections were used in the development of the COG 2020 transportation-planning database.

The basis for the projections is the King Street/Eisenhower Metro Station, Seminary Hill/Strawberry Hill and Landmark/Van Dorn Small Area Plans.

Question 3: What will the full effect be on Ben Brenman Park?

Response: The impacts on Ben Brenman Park are described in the publicly available documentation attached to the docket item. If there are specific areas of interest not addressed in this documentation, staff will be pleased to provide additional information as may be available.

Answers to Councilwoman Eberwein's Questions

Question: **I want more complete information regarding the two lane and three lane options. I want information fleshed out regarding costs and traffic/safety/environmental issues associated with a "police/fire/ems only" road. Want more specific information regarding potential mitigation options – particularly with regard to Ben Brenman Park.**

Response: See attached.

October 29, 2002

Two-Lane Connector Alternates
Preliminary Findings

I. Background: The analyses conducted for the Eisenhower Avenue to Duke Street Connector Study assumed each connector would be four lanes with 91-foot bridge sections. This white paper discusses the impact of alternative two-lane sections on traffic service and resource impacts.

The two-lane minimum bridge section with a 10-foot multipurpose trail will be 51 feet wide. This section is based on minimum standards for undivided roadways (double yellow line only) and does not include a barrier between the multipurpose trail and the traffic lanes. The four-lane 91-foot section includes a 16-foot median.

Traffic demand on each connector was reduced so that the termini would be slightly over capacity. Capacity was measured using the Critical Lane Method. Traffic at the termini was balanced, and then the volumes at adjacent intersections were adjusted. North / south traffic demand not served by the connectors was reassigned to Van Dorn and Telegraph.

Impacts and costs were revised based on the smaller width roadway and bridge. Changes in traffic volumes, delay, impacts and costs were evaluated and are shown for Alternates A2, B1, C and D.

II. Changes in Traffic Service.

The traffic on the Connectors is expected to decrease by approximately 25%. Overall, this is expected to slightly increase traffic on Van Dorn and Telegraph and slightly decrease traffic on Clermont and N Quaker. Table A below shows changes in Average Daily Traffic (ADT) for Alternates A2, B1, C and D.

Table A. Change in 2020 ADT with 2 Lane Connectors

	A2	A2 2L	B1	B1 2L	C	C 2L	D	D 2L
Van Dorn	46,700	48,400	47,300	49,440	54,400	55,400	54,400	55,400
Telegraph	62,100	62,100	57,200	58,200	50,000	51,400	51,200	52,600
Clermont	33,500	33,500	47,100	45,100	26,500	25,500	26,500	25,500
N Quaker	28,500	28,500	32,900	32,400	31,500	30,000	32,000	31,000

Table IV – 10 (Revised), on the following page, shows the revised delay for intersections in the network. Connector intersection approaches are restricted to three lanes with the two-lane section (left, through and through & right or right only). With the four-lane section, these intersection approaches were four lanes.

Overall delay, shown in bold, is generally about 10% higher for the two-lane options compared to the four-lane options.

Table IV-10 (Revised). Simulation Results, 2020 PM (Average wait in seconds) (With Two-Lane Connector)

Intersection		No Build	Alt A2	Alt A2 Prime	Alt B 1	Alt B1 Prime	Alt C	Alt C Prime	Alt D	Alt D Prime	NB w/ Imp
Eisenhower Ave											
	Van Dorn	206	54	76	97	131	194	206	163	209	11
	Clermont	112	87	100	86	84	137	137	118	118	122
Van Dorn Street											
	Mall	218	166	175	133	135	263	273	162	162	120
	Edsall	120	203	211	98	97	96	100	97	97	102
	Pickett St	116	196	212	80	82	123	121	132	128	43
Duke Street											
	S Pickett	26	15	20	32	42	25	31	38	38	29
	Pickett/ Cameron	17	19	23	15	17	17	17	20	20	17
	Jordan	95	23	30	18	22	19	22	16	19	31
	N Quaker Ln	87	36	42	38	42	34	37	31	33	30
	S Quaker Ln	15	15	15	19	20	19	19	16	16	17
	Sweely St	53	44	50	43	61	34	46	41	52	30
	Cambridge St	70	33	44	50	64	42	52	31	38	15
	W. Taylor Run Pk	21	16	18	13	14	11	11	7	7	11
Seminary Rd/Janeys Ln											
	Jordan	38	27	33	17	20	22	24	17	19	15
	Ft Williams Pkwy	14	7	8	7	7	7	7	9	9	11
	N Quaker Ln	34	62	62	46	46	37	37	35	35	45
	Yale St	50	61	61	41	41	61	61	35	35	33
Total Network Delay		**336**	**284**	**310**	**188**	**201**	**228**	**235**	**256**	**288**	**219**

III. Impacts and Costs

Natural Environment: Impacts to forests and surface water resources are reduced about 40% by the two-lane options as compared to the four-lane alternates. Permitting requirements will remain unchanged.

Cultural Resources: The potential for encountering archeological resources will be not be significantly different with the two-lane section. Overall, the impacts to cultural resources is unchanged.

Socio Economic: The socio-economic benefits from the connectors will be retained with the two-lane sections. Emergency response time benefits are also unchanged, and recreational facilities will still be connected with the smaller roadway.

Park impacts will be reduced for the B1 alternate. Alternates A2, C and D will all have fewer commercial takings with the two-lane section.

Revised Table IV-1 Resource Impacts by Alternate and Table IV-2 Socio-Economic Benefits and Impacts by Alternate are on following pages. The two-lane section alternatives are shown in **bold.**

Construction and Right of Way Cost: Costs will be less with the smaller typical sections. The 51-foot right-of-way was assumed for bridge and at grade sections. This smaller section saves considerable right-of-way expense. Existing roadways, such as Roth and Wheeler will not require extensive widening.

Alternate	Estimated Cost		
	Right of Way	**Construction**	**Total**
No Build	0	0	0
No Build with Improvements	$ 17,000,000	$ 38,000,000	$ 55,000,000
Alternate A1	8,100,000	26,900,000	35,000,000
Alternate A2	16,600,000	19,000,000	35,600,000
Two-Lane Alternate A2	**9,100,000**	**12,300,000**	**21,400,000**
Alternate B1	500,000	33,000,000	33,500,000
Two-Lane Alternate B1	**300,000**	**19,900,000**	**20,200,000**
Alternate B2	500,000	35,200,000	35,700,000
Alternate C	3,000,000	15,700,000	18,700,000
Two-Lane Alternate C	**1,400,000**	**10,300,000**	**11,700,000**
Alternate D	5,800,000	19,000,000	24,800,000
Two-Lane Alternate D	**2,200,000**	**12,200,000**	**14,400,000**

TABLE IV-1 (Revised). Resource Impacts by Alternate (With Two-Lane Alternates)

	Alt A1	Alt A2	Alt B1	Alt B2	Alt C	Alt D	NB w/ Imp.
Natural Environment							
Wetland Impacts	0	0	0	0	0	0	0
Permit Challenge	Individual	General	General	General	None	None	General
Forests Impacts (acres)	1.61	.52	1.27	1.39	.18	None	1.21
Two-Lane Option	-	**.29**	**.71**	-	**.10**	**None**	-
Floodplain (acres)	.528	1.652	0.578	1.016	None	None	None
Two-Lane Option	-	**.92**	**.32**	-	**None**	**None**	**None**
RPA (Waterway Buffer) (acres)	4.6	5.63	8.1	8.47	None	None	0.06
Two-Lane Option	-	**3.13**	**4.5**	-	**None**	**None**	-
Stream Crossings	3	2	2	5	None	None	None
Cultural Resources							
Potential for Disturbing Historic/Prehistoric Archeological Resources	Medium Potential	Medium Potential	High Potential	High Potential	High Potential	Medium Potential	Medium Potential
Known Archaeological Sites Within 100'	No known sites	No known sites	2 known sites	2 known sites	2 known sites	No known sites	No known Sites
Potential for Disturbing Historic Resources eligible or listed on the National Register	None	None	None	None	None	None	None

TABLE IV-2 (Revised). Socio-Economic Benefits and Impacts by Alternate (with Two-Lane Alternates)

	Alt A1	Alt A2	Alt B1	Alt B2	Alt C	Alt D	NB w/ Imp
Socio Economic Benefits							
Change in emergency response time to Point A	N/A	N/A	N/A	N/A	-3.33	-2.33	Zero
Change in emergency response time to Point B	-1.96	-1.68	-2.07	-2.15	N/A	N/A	Zero
Community facilities within ½ mile of termini	3	3	4	5	4	7	N/A
Bicycle or general use trails connected	2	2	3	4	2	2	Zero
Cultural Resources							
Acres of Parks taken	1.99	0	3.27	3.63	0	0	0
Two-Lane Option	-	**0**	**1.82**	-	**0**	**0**	**0**
Park activities impacted	1	0	2	2	0	0	0
Potential for through traffic in residential areas	Low	Low	Low	Medium	Medium	Low	None
Number of residences taken	0	---	0	0	0	0	0
Number of businesses taken	8	9	0	0	4	3	9
Two-Lane Option	-	**6**	**0**	**0**	**0**	**0**	-
Number of sensitive noise receptors ¼ mile	1	1	3	3	2	1	---
Number of residences within 500'	11	0	331	325	156	145	---

IV. Conclusions

The alternative two-lane sections will have less impacts and lower costs. The traffic benefits from improved connectivity will be slightly impacted by the reduced section. Generally, overall delays will be increased about 10%.

The two-lane section will not have a median, and only standard shoulders. It will be more difficult to reroute traffic around accidents on the roadway. Snow removal will also be more difficult without the median. Finally, future expansion will be difficult.

Answers to Councilman Euille's Questions

Question 1: Once again, please provide a rational reason as to why the need for a connector.

Response: In staff's professional view, an additional roadway between Eisenhower Avenue and Duke Street is desirable for the reasons in the October 8 docket item (pages 8 and 9). These reasons can be summarized as follows:

(a) It will improve connectivity between Eisenhower and Duke which will result in less traffic congestion on Van Dorn, Duke, Telegraph and Eisenhower;

(b) It will improve the access into and out of Eisenhower Valley for police, fire and EMS personnel, and for Alexandrians who live, work or visit there (e.g., to shop, to eat, to be entertained, to bike or walk);

(c) It will, by reducing congestion on Duke, lessen the potential of vehicles diverting from Duke to and through adjacent residential neighborhoods and local streets;

(d) It will, as a result of increasing access into and out of Eisenhower Valley, make the Valley a more desirable place to live, work and visit, thereby benefitting the timing and quality of development that will occur within the Valley;

(e) It will not increase, in any significant manner, the amount of traffic traveling across the southern end of the City (Van Dorn to Washington) Street and, therefore, will not cause any significant increase in the traffic on North Quaker or on neighborhood streets north of Duke. This is because the roadway is not intended to increase the capacity of the City's road network to carry additional cars, but to improve connectivity between Eisenhower and Duke, thereby redistributing existing traffic among the roads that now carry vehicles between Eisenhower and Duke and the Eisenhower-to-Duke roadway itself.

Question 2: Do we have economic impact analysis for each of the "Build Options?" If so, please provide. If not why not?

Response: The Fuller Study done for the Eisenhower Partnership is included in the docket item (Attachment 8, Task Force Report, Appendix 6, note pages 3-5), as are the costs to the City from the different options (Attachment 7, Staff Report, Table 8). The Fuller Report attempts to quantify the economic impact of development in the Eisenhower Valley, and then indicates that an Eisenhower-Duke roadway will

help the development be realized. The report itself does not quantify the increment of economic impact of this roadway.

Staff do not believe that a sound and reliable study, which quantifies the economic impact of an Eisenhower-Duke roadway, can be done with any real degree of confidence. In other words, quantifying the net revenue to the City which would be produced from development in the Valley with an Eisenhower-to-Duke roadway (a micro-economic analysis) , and without such a roadway, would require so many macro-economic regional assumptions regarding the roadway's direct affect on development that the results would appear highly speculative and be of questionable value. The fact that Dr. Fuller did not structure his study this way confirms this.

An Eisenhower-to-Duke roadway will, it is believed, benefit the development of the Valley not so much by enabling more development to occur than would otherwise be the case, but by accelerating the timing of development and its quality and value. These impacts on development will be beneficial, from a fiscal perspective, to the City, but the quantity of that benefit cannot be accurately projected.

Question 3: What input, if any, for all of the options did the Planning Department provide? Same for Parks and Recreation?

Response: Kimberly Fogle of Planning and Zoning attended many of the meetings and brought the East Eisenhower planning process into the discussion. Parks and Recreation staff and Board members also have been to meetings and hearings.

Question 4: Why isn't the issue of a connector not part of an overall "Transportation Management Plan?" And when will this plan be available?

Response: The Eisenhower Connector Study has used information from the Comprehensive Transportation Policy and Program. The connector could, of course, be part of the Comprehensive Transportation Policy and Program. However, the value of doing so is debatable since the pro's and con's of a connector roadway, and of the various optional roadway locations, stand pretty much on their own, and would not be significantly affected by the types of undertakings likely to come out of the comprehensive transportation program. For instance, it certainly is not anticipated that major expansions to the capacity of the City's roadway system, which might eliminate or reduce the need for additional connectivity between Eisenhower and Duke, which a connector roadway provides, will be recommended at the conclusion of the comprehensive study effort; nor it is anticipated that transit recommendations could be made that would eliminate or reduce the need for this connectivity. We expect the Comprehensive Transportation Plan and Program work to be completed in 2004.

Question 5: Are there quite possibly other solutions, other than a "Connector" to the traffic reduction desires on Duke Street?

Response: There are other ways to deal with congestion on some parts of Duke Street, but they do not provide increased connectivity between Duke and Eisenhower, do not provide the needed additional access into and out of Eisenhower Valley for public safety vehicles and personnel, do not provide Alexandrians (including the thousands who will be living and working in Eisenhower Valley) an improved way to get to and from the Valley, and quite possibly would result in more cut through traffic in residential neighborhoods north of Duke than an Eisenhower-to-Duke roadway.

Question 6: What are the guarantees that Option B1 will not open the flood gates for outside of the City traffic to use it, further impacting Duke Street?

Response: As seen at the October 29 work session, none of the options are projected to have the effect of expanding in any significant way the capacity (i.e., the number of vehicles) traveling across the southern part of the City (the Van Dorn to Washington screenline). For example, under Option B1, 5,200, or 2%, additional vehicles are projected, on average, to travel across the screenline in 2020 when compared with the "No Build" Option.

While this is only a projection and will not be the actual number of additional vehicles, it shows generally the relative magnitude of the additional vehicles associated with Option B1 – on the order of 2% of the vehicles crossing the screenline without a connector. Were a connector roadway built, any neighborhood cut-through traffic would be addressed with street closures, traffic calming measures, traffic turn regulations/restrictions, and similar mitigation measures.

Answers to Councilwoman Woodson's Questions

Question 1: How will a connector make travel easier for Alexandrians vs. others traveling on Duke Street?

Response: A connector allows Duke, which is capacity constrained, to work in tandem with Eisenhower, which has capacity available. This will free up capacity on Duke. This new, available capacity will be utilized by local travelers (or Alexandrians), as shown by the analysis performed on the connectors and Quaker. When capacity is freed up on a collector or arterial roadway, the new capacity is first taken by local trips (i.e., vehicles traveling to or from a point near the roadway, as opposed to vehicles traveling to distant points). This is consistent with the normal experience of traffic engineers. See Table 7 in the Staff Report.

By keeping arterial traffic on arterial roadways, traffic will not divert through neighborhoods, thereby keeping local streets largely for use by neighborhood residents.

See also response to Question 1 of Councilman Euille.

Question 2: How can we be certain that a connector will not increase traffic driving through Alexandria? (Section 1, page 9)

Response: No decision can ever be made with absolute certainty. However, projections of 2020 traffic volumes and conditions, with and without a connector, have been made using the best available information, methodologies and technology, including MWCOG's approved regional travel demand forecasting model, traffic operations analysis software adopted by the U.S. Department of Transportation and the Transportation Research Board, and advanced microscopic traffic simulation software with dynamic route assignment capability. Also, as discussed at the October 29 work session, some, but relatively few, additional vehicles are projected to travel through the City if a connector is built (compared to the "No Build" option). For instance, under Option D, 3,600 additional vehicles per day will travel across the Van Dorn to Washington screenline, as compared to the 256,400 vehicles crossing the screenline per day under the No Build option; this amounts only to a 1.4% increase in the number of vehicles crossing the screenline. Certainly, many, but <u>not</u> all, of those additional vehicles would be vehicles driving through Alexandria.

Additionally, in May 2002, a "manual" license plate study was conducted at the area bounded by Seminary, Jordan, Duke, Taylor Run and King. This was done to learn the nature of the motor vehicles entering and exiting this area during the a.m. and p.m. two-hour periods. The license plate survey did not identify vehicles traveling through the City, but vehicles traveling through this inside-the-City

study area. Interestingly, this license plate study revealed that: (1) almost two-thirds the traffic entering or exiting the study area in the morning and evening peak periods had either an origin or a destination in the study area; (2) slightly more than one-third of the traffic was external to the study area (i.e., had an origin and destination outside the study area); and (3) significantly less than one-third of traffic was external to Alexandria (i.e., had an origin and destination outside the City). The study revealed the following: (a) a total of 11.383 vehicles entered or exited the area in the a.m. two-hour period, and (b) 4,224 vehicles (35% of total) entered the area and exited at a different point ("cut-through" vehicles). These "through" vehicles are vehicles with both an "external to the study area" origin and destination outside the study area. Thus, they consist of (i) vehicles with an origin and destination outside Alexandria, (ii) vehicles with an origin in Alexandria and a destination outside the City, and (iii) vehicles with an origin outside of Alexandria and a destination in the City. The study was not able to determine the breakdown of the "through" vehicles; (c) 3,530 vehicles (31%) entered and did not exit (likely persons working in the area); (d) 3,148 vehicles (28%) exited the area only (likely residents leaving for work); and (e) 481 vehicles (4%) entered and exited at the same point (likely parents bringing children to school). Similar findings were made in the p.m. two-hour peak period.

In other words, of all the traffic crossing one of this north-of-Duke study area's nine monitoring locations (i.e., the traffic entering or exiting the area) in the a.m. two hour peak period, slightly more than one-third (37.1%) was traffic which traveled through the area. An undefined portion of that traffic (but certainly substantially less than a third) was external to Alexandria; the remainder was internal to Alexandria in that it had an origin or destination in the City). Slightly less than two-thirds (63%) of all vehicles had some "attachment" to the study area in that they entered and remained, exited only, or entered and quickly exited at the same location.

Question 3: **With the development of Eisenhower Valley East and West, what will be the full traffic impact when fully built out: a) with a connector; and b) without a connector?**

Response: The 2020 analyses were based on projected development levels for that year contained in the MWCOG model. The traffic projections done to date on the connector project, which utilizes the MWCOG model, show that a number of traffic conditions (delays at intersections, lengths of queues, and overall delay) will be worse without a connector than with one. See Tables 4 and 5 of Staff Report. Probably the best overall indicator of this is in Table 4 which shows the "overall network" delay associated with the No Build and the various Build Options. Overall delay in 2020 with the No Build Option is projected at 336 seconds per vehicle; delays for the Build Options are projected at: 284 seconds

(15% reduction) for A1/A2; 188 seconds (44% reduction) for B1; 177 seconds (47% reduction) for B2; 228 seconds (32% reduction) for C1; and 256 seconds (24% reduction) for D.

It is important to remember that the future increase in traffic in Alexandria is not attributable only to development along Eisenhower Avenue. It also is affected by the growth in the City's population in other areas, by increased travel by our population, and by increases in background traffic into and through the City.

Question 4: With a new Woodrow Wilson Bridge, and the new ingress and egress for the Eisenhower Valley, what will be the impact on Alexandria with and without a connection?

Response: All of the projections did assume the new bridge and the new access ramp from the Beltway at Mill Road to be in place.

Question 5: If a connector will increase the use of Clermont, why wouldn't it increase the traffic in Alexandria? (Who will use the Clermont exit who doesn't use it now?) (Section 7, page 9)

Response: The increased use of the Clermont interchange stems almost entirely from a reallocation of vehicles which otherwise (i.e., without a connector) would use the Van Dorn, Telegraph or Route 1 interchanges. In other words, drivers who, without a connector, would find it most convenient to travel to their destination (in or outside Alexandria) by entering or exiting the Beltway at the Van Dorn, Telegraph or Route 1 interchanges will find it more convenient with a connector to use the Clermont interchange. While some new users of the Clermont interchange will be vehicles which, but for the connector, would not enter the City at all, the vast majority will be vehicles which, even without the connector, would be in Alexandria and would use the Van Dorn, Telegraph or Route 1 interchanges to enter or exit the City.

This "reallocation" principle is no different than the principle discussed at the October 29 work session as applied to the nature of the vehicles using a connector. As noted earlier, under the No Build Option, 256,400 daily vehicle trips are projected to cross the Van Dorn to Washington screenline in 2020. Under the various Build Options, only 0.5% to 2.0% additional vehicles are projected to cross the screenline. The No Build with Improvements alternate would increase crossings of this screenline by 3.5%. In other words, the Build Options are only projected to result in between 1,200 and 5,400 "new vehicles" crossing (heading north or south) the screenline, with "new vehicles" defined as those which, without a connector, would not cross the screenline. While these "new vehicles" include vehicles which, without a connector, would not enter or be

in Alexandria at all (i.e., new vehicles with neither an origin nor destination in the City), they also include vehicles which, without a connector, would travel in the City but via routes which did not take them across the screenline. Thus, for instance, while 5,280 "new vehicles" are projected to cross the screenline under connector Option B1, not all of these are external-to-Alexandria vehicles.

Question 6: What additional traffic mitigation will be used other than a connector should a connector be accepted?

Response: Were a connector roadway built, neighborhood cut-through traffic would be discouraged and limited by means of street closures, traffic calming measures, traffic turn regulations and restrictions, and similar protective mitigation measures designed to keep cut-through traffic off of neighborhood streets.

Question 7: If the idea is to limit traffic, why does the chart on page 15, section 7 state that traffic will increase more with Build options than with No Build options?

Response: As discussed at the October 29 work session, the purpose of a connector is to promote connectivity and roadway efficiency, not to increase the capacity of the City's road network and hence the number of vehicles traveling in the City. This is not to say, however, that no additional vehicles will travel on the connector roadway. But, as explained in the response to Questions 2 and 5, the number of these additional vehicles (one of the "costs" associated with the connector) is projected to be relatively very small.

Table 1, page 7, of the Staff Report shows, for the different connector Build Options (versus the No Build Option) the number of additional vehicles, and the numbers range from 1,200 vehicles under Option A2 to 5,400 under Option B2. Table 7, page 15, shows the additional vehicles per day on North Quaker for the various Build Options (versus the No Build Option), and the numbers range from zero under Options A1/A2 to 4,500 (a 15% increase) under Options B1/B2. Since North Quaker is an arterial, it is to be expected that some of the additional vehicles associated with a connector will travel along North Quaker (and not on residential streets). As Table 6, page 14, shows, none of the Build Options is projected to result in a significant increase (versus the No Build Option) in the number of vehicles traveling on local streets north of Duke.

Question 8: How will the connector enhance development in Eisenhower Valley? How will the lack of a connector limit development in Eisenhower Valley? What is the economic impact on Alexandria?

Response: The Fuller Study done for the Eisenhower Partnership is included in the docket item (Attachment 8, Task Force Report, Appendix 6, note pages 3-5), as are the costs to the City from the different options (Attachment 7, Staff Report, Table 8). The Fuller Report attempts to quantify the economic impact of development in the Eisenhower Valley, and then indicates that an Eisenhower-Duke roadway will help the development be realized. The report itself does not quantify the increment of economic impact of this roadway.

Staff do not believe that a sound and reliable study, which quantifies the economic impact of an Eisenhower-Duke roadway, can be done with any real degree of confidence. In other words, quantifying the net revenue to the City which would be produced from development in the Valley with an Eisenhower-to-Duke roadway (a micro-economic analysis) , and without such a roadway, would require so many macro-economic regional assumptions regarding the roadway's direct affect on development that the results would appear highly speculative and be of questionable value. The fact that Dr. Fuller did not structure his study this way confirms this.

An Eisenhower-to-Duke roadway will, it is believed, benefit the development of the Valley not so much by enabling more development to occur than would otherwise be the case, but by accelerating the timing of development and its quality and value. These impacts on development will be beneficial, from a fiscal perspective, to the City, but the quantity of that benefit cannot be accurately projected.

Question 9: Why is "C" not given as much value as "D" or B1?"

Response: Options C, D and B1 all have advantages and disadvantages.

- B1 has the greatest traffic benefit, but has the greatest environment and park impacts.
- C is the easiest to construct. However, there are unresolved operational issues at Wheeler/Duke/Quaker.
- D will do the most for East Eisenhower. However, it will require a significant bridge and terminates opposite Cambridge (though traffic can be prohibited from traveling from the connector to and from Cambridge and Yale).

Question 10: Why is Quaker Lane "off limits?"

Response: It has not been "off limits," for analysis purposes. The impact to North Quaker, the make up of traffic on North Quaker, the existing traffic characteristics on North Quaker Lane, the potential through traffic on North Quaker, all have been examined.

Question 11: Why are we not making significant improvements to the Braddock, Quaker, King intersection?

Response: Over the past three decades, this intersection has been studied for construction of an overpass, and an underpass as well. Residents in the areas of Seminary Hill, North Ridge and Clover/College Park have questioned any improvements which would increase the intersection's capacity and thereby, it is believed, induce more external-to-Alexandria traffic on North Quaker. The intersection is seen by many, accurately staff believe, as "metering" travel on North Quaker and increasing travel time, thereby discouraging travel by external traffic.

Question 12: Why wasn't a highway-type connection built or considered between I-395 and the Beltway at Van Dorn and Duke in Landmark?

Response: Such a highway-type connector would primarily serve commuter traffic from beyond Alexandria, and would not serve Alexandrians as much as other alternates would.

Question 13: If "D" is one of the least effective routes for improving total network delay, why is it still being considered? (Section 7, page 9)

Response: Total network delay is one of the many traffic considerations, and traffic is just one of the many criteria that have been examined. In any event, Option D scores poorly on the "overall network delay" factor only because it produces small "delay" benefits in the west end, specifically along Van Dorn. Its benefits along Duke and Seminary/Janneys are comparable, if not better than, the other Build Options (see Table 4, page 10). Achieving delay reductions along Duke and Seminary/Janneys have been viewed as more important than along Van Dorn because Van Dorn, especially in the morning and evening peak periods, is largely a route for external-to-Alexandria commuters.

Question 14: Wait times and network delays are confusing. It appears that there are insignificant differences between the various alternatives except No Build and "C." Why is that? (Section 7, page 10)

Response: Actually, some significant differences between the No Build Option and the different Build Options are projected. For example, at Eisenhower and Van Dorn, the No Build delay in 2020 is projected at 206 seconds, while A1/A2 are at 54 seconds, B1 at 97 seconds, C at 194 seconds and D at 163 seconds. At Van Dorn and the Mall entrance, No Build is projected at 218 seconds, while A1/A2 is at 166 seconds, B1 at 133 seconds, C at 163 (the "263" in Table 4 is in error) seconds and D at 162 seconds. At Duke and Jordan, No Build is projected at 95 seconds, while A1/A2 is at 23 seconds, B1 at 18 seconds, C at 19 seconds.

Meaningful differences also exist at Duke and North Quaker. The small differences at other locations are due to extreme congestion on City roadways. Overall network delay provides a good overall performance.

Question 15: Alternate "C" offers the lowest number of cut-through estimations for residential roads except Jordan, but "C" is not considered a preferred alternative. Why is that? (Section 7, page 14)

Response: The improvement with C is not considered large. But, again, this is just one traffic service indicator.

Question 16: The preferred alternate "B1" has the highest number of cut-through estimations. Why is it preferred? (Section 7, page 14)

Response: The potential cut-through is not significantly higher than the "No Build." Actually, for West Taylor Run, B1 has fewer projected cut-through vehicles than D, and for Jordan it has fewer than C. Again, this is one of a number of traffic service indicator.

Question 17: The top portion of Table 7 in Section 7, page 15, is confusing? Please explain. The bottom portion suggests that all except No Build with Improvements will have higher external traffic. Why is that? How does this table support a connector?

Response:

- Table 7 shows external-to-Alexandria traffic on Quaker Lane. The No Build is projected to have 9,700 external trips per day by 2020. All of the alternates, including No Build With Improvements, are projected to have more than 9,700 external trips per day by 2020.
- Generally, the portion of external traffic on North Quaker, as a percent of all traffic, stays the same in 2020, about 34%.
- The largest increase is B1, with 1,800 new external trips per day. This is about 180 trips during a busy peak hour, or 3 per minute.
- The potential for cut-through (Question 16) is greater as a result, but not significantly so.

Question 18: Have all of the financial considerations been entered except the purchase of replacement land for "B1?" What additional purchases of land are missing from financial estimations on Table 9, Section 7, page 16?

Response: The cost estimates are preliminary and were prepared to provide a comparative analysis. It is too preliminary to determine specific right of way purchases.

Question 19: According to the rankings in Table 10, Section 7, page 18, D and then C should be the preferred options, not B1 and D. Why does staff recommend B1 first and then D?

Response: As noted in the Staff Report, page 19, the differences among the overall rankings for Alternates B1, B2, C and D were not considered to be significant decision differences. Given comparable overall rankings, staff recommended Alternate B1 based on its higher traffic service benefits. Alternate B1 did not eliminate staff concern regarding the ultimate feasibility of B1, and Alternate C potentially created a difficult weaving condition on Duke Street. Alternate D was therefore selected as the "second choice" Alternate.

Question 20: Why were different categories weighted more heavily than others? For example, why was traffic benefits weighted more heavily than social impact in Table 11, Section 7, page 20? How were the categories defined for their relative importance in the weighting process? If the weighting for each category was the same, we would have a different result.

Response: In order to maintain balance between benefits and impacts, 100 total weighting points were available for each. Within the overall benefits category, each benefit criterion was weighted relative to all other benefit criteria, while holding the total weight for all benefits at 100 points. Each impact criterion was similarly weighted against all other impact criteria, with the total weighting for impacts held to 100 points. This process maintained balance between benefits and impacts with the intent of seeking to identify those alternates with the lowest impacts and highest benefits. The category weights in Table 10 represent the total points assigned to the individual criteria in each category. If the criteria weights were changed, the results would also change.

Question 21: Section 8 has contradictory statements on page 6 under Alternate C. How was this resolved in the task force meetings?

Response: Staff cannot locate the referenced statements.

Question 22: Section 9 has many statements of findings, but lacks supporting evidence. Please explain why:

- **External traffic is not expected to increase as a percentage of volume on Quaker.**

  Response: As seen on other area arterials, the percentage of external traffic is relatively constant over all alternates. This is attributed to (1) growth in Alexandria travel displacing

external travel and (2) the relatively low regional impact of the connector alternates.

- **Why will Quaker become a slightly less attractive route in the next 20 years?**

  Response: Assuming this is a reference is to the decrease in external traffic, please see previous item, point (2).

- **Why does C and D provide the greatest eastbound a.m. movement at Duke and Daingerfield?**

  Response: Assuming this relates to reductions in queue lengths (Table 5, page 11), the greater the distance between and Alternate and the Duke Street/Daingerfield Road intersection, the less impact the Alternate has on traffic at the intersection. Alternates other than C and D are too far away to have significant impact on this intersection.

- **How do all alternatives improve Duke and Quaker, with greatest benefit with No Build?**

  Response: Assuming this question also relates to reductions in queue lengths (Table 5, page 11), the No Build with Improvements alternate adds an additional eastbound lane on Duke Street from Quaker Lane to the existing Telegraph Road on ramp. This increased capacity allows reallocation of signal capacity, thereby reducing queuing on Quaker Lane.

- **Why does C provide some relief to Van Dorn and Edsall, but no other alternatives? Doesn't this suggest increased traffic on Quaker?**

  Response: Alternates B1, B1, C and D provide essentially the same degree of improvement at this intersection (see Table 4, page 10).

- **If No Build with Improvements provides relief to Van Dorn and Pickett and Edsall, as well as the most improvements at Quaker and Duke, why is it not more favored?**

  Response: This alternate improves operating conditions on Van Dorn, but does so essentially by converting Van Dorn to what

could be viewed as an expressway. It does not offer any improved accessibility to Eisenhower Valley or better connectivity between the Valley and the remainder of the City.

- **Why will No Build with Improvements increase traffic on West Taylor Run?**

  Response: It is assumed that this question refers to data presented in Table 6, page 14. These data are estimates of potential cut-through volumes, not total volumes. This increase is most likely attributable to the increased capacity on Duke Street provided by this alternate, attracting vehicles through the Clover-College Park area.

- **Have the Average Daily Traffic (ADT) counts been calculated for AM/PM rush hours of for any time?**

  Response: This question is unclear. ADT volumes were used for general reporting purposes; however, AM and PM peak hour volumes were used for operational analyses.

Question 23: Why are we only considering one four-lane connector instead of several smaller two-lane connectors?

Response: This question has become moot.

Question 24: How does the connector fit into other long range comprehensive traffic plans and other long range plans for the development in the city?

Response: City policy is to keep arterial traffic on arterials and out of neighborhoods and off of local streets. This is the basis for our Comprehensive Study, neighborhood traffic calming program, and pedestrian programs.

Question 25: Why is the development of Eisenhower Valley not entered into the equation when it has so much to do with the decision? What is the financial impact on the City of Build vs. No Build vs. No Build with improvements?

Response: See response to Question 8.

Question 26: What is the long-range vision for the City of Alexandria and how does the connector fit in that vision?

Response: Please see responses to Questions 1, 2 and 3 regarding transportation issues.