Alexander Street and University Place Transit Task Force
February 12, 2014
Meeting Minutes

In Attendance:
Committee Members: Appelget; Jackson, Liverman, Simon, Wilkes
Staff: L. Solow; R. Kiser, J. West
Also in attendance: K. Cherry, C. Crider; R. Fisk; A. Lahnston; S. Sturges, R. Widner

Discussion

Attached to the minutes is Addendum A (R. Widener memorandum dated 1/7/14 re: AECOM Reports) and Addendum B (R. Widener memorandum dated 1/7/14 re: URS Reports) addressing concerns found in the initial data generation that the consultants should review. Mr. Widener discussed his 1/7/14 memorandum and questioned the calculations being presented pertaining to the anticipated traffic increase on Alexander. Mr. Widener suggested that AECOM be asked to justify their numbers and identify which data set they are using. The traffic projections generated by AECOM and the DVRPC appear to be very different. Mr. Widener questioned whether the 2012 data includes a traffic reduction for the medical center relocation.

Mr. Widener requested that AECOM explain how they arrived at future traffic growth in Princeton and specifically Alexander. The amount of through traffic on Alexander, shown in the AECOM pie charts appears high.

Pertaining to one way traffic circulation on Mercer and Alexander, Mr. Widener stated that Route 206 south of the intersection with Nassau is outside of the focus area. He recommended that this area (Elm/Great Road/Route 206/Lovers Lane) be included in the focus area since Elm Road traffic will be aggravated by this one way recommendation. Once finalized, the Report will be posted on the website with individual web links on background studies.

Mr. Widener outlined his concerns with the URS Study. Mr. Widener indicated that he believed workers that come in to Princeton (approx. 25,000) are not addressed in the study and URS needs to address what market we are trying to serve. He suggested another stop on the Dinky near Route 1 which could serve as a transit hub.

Other comments on the transit study included the following:

- URS should give a full picture of both the commuters in and out of Princeton to determine the transit opportunities.
- More research is needed about the residents who park their car in West Windsor instead of using the dinky to help understand why this is being done.
- A detailed analysis of the markets for transit and our options to meet those needs would be beneficial. The Free B is not utilized as often as it should be. A jitney system for the Route 1 corridor was suggested to connect to all the large businesses on Route 1.
- A journey to work census would be very helpful to determine the ridership and then the possible solution to serve that population.

Task force members recommended Mr. Widener's memoranda be forwarded to URS.

Staff advised that the URS forecasts should be available in late March.

Minutes:

- November 6, 2013 - motion was made by Appelget and Jackson seconded to approve the minutes of November 6, 2013.

- November 27, 2013 - motion was made by Appelget and Jackson seconded to approve the minutes from November 27, 2013
- December 11, 2013 – motion was made by Appelget and Jackson seconded to approve the minutes from December 11, 2013

Next Steps

- AECOM to provide more detail about their assumptions
- Report before Council anticipated for late April or early May.

Next Meeting: March 26, 2014

ADDENDUM A

January 7, 2014

To: Kevin Wilkes, Chair, ASUP Task Force
cc: Kristen Appelget, Nat Bottigheimer, Kim Jackson, Robert Kiser, Lance Liverman, Pat Simon, Lee Solow, Jack West, Anton Lahnston, Marvin Reed.
From: Ralph Widner
Subject: AECOM Reports and Task Force Work To Date

INTRODUCTION

Attached are areas of serious concern that AECOM and the Task Force should examine. My comments are intended to elicit rebuttals and more substantive and transparent explanations from AECOM. So far, we have pretty good reports on traffic management but they rest upon very wobbly, opaque, and deficient analyses of future traffic without which it will be almost impossible to secure public support for major alterations in traffic flows.

Even if the Task Force had not been charged to come up with recommendations regarding transit, the AECOM study has been worthwhile. It suggests a number of traffic management proposals for our consideration that significantly broaden options beyond those suggested in the 2006 *U.S. 206 Vision Study* to deal with present (and not just future) congestion and confusion at our most problematic set of intersections (Alexander/Mercer/University Place/Nassau/U.S. 206). However, as explained below, as it stands AECOM's traffic projection can not withstand public scrutiny and debate; and (2) the full ramifications—and ways to deal with—the impact of the various suggested traffic management options on heavily impacted streets just beyond AECOM's current "focus areas" need to be spelled out if you are to win public acceptance of some proposals to alter traffic flows.

CONTENTS

A. THE TRAFFIC FORECASTS

#1. Concerns about AECOM's estimated current peak PM traffic volume on Alexander

Assume the Task Force received the following two estimates—

In 2010:
"We project that peak PM traffic volume on Alexander Road this year will increase by 8.5% to 1,998 in 2027."
In 2012:
"We project that peak PM traffic volume on Alexander Road this year will increase by 110% to 1,998 in 2027."

What actions would the Task Force propose based upon the 2010 estimate versus the 2012 estimate? And what differences would you expect in public support for actions based on the 2010 versus 2012 estimate? Both anticipate the same traffic volume in 2027, yet they forecast radically different absolute and percentage increases in volume from their baseline year. How can this be?

The reason: in its 2012 *estimate* of peak PM traffic on Alexander (948 vehicles), AECOM's model—presumably and quite appropriately—was instructed to take into account the *drop* in the number of Princeton in-commuters when the medical center moved to Plainsboro in May. Out of a total reduction of 1,514 in the number of these former in-commuters, AECOM apparently assumes that 893 drivers who once used Alexander to commute into and out of Princeton no longer do so (Table 1).

Prior to the hospital move, residents lived for years with PM peak traffic of about 1,894 vehicles at the same time and spot on Alexander—just about double the volume estimated by AECOM for 2012 and only 157 vehicles short of AECOM's *total* forecast for the PM peak in 2027. If the community is only going to see an increase from 2010 to 2027 of 8.5% vehicles during the peak PM rush, residents are far more likely to challenge any need to re-direct traffic flows through their neighborhoods.[1]

Is AECOM's forecast of a drop of 893 in the volume of vehicles at the PM peak from 2010 to 2012 on Alexander plausible? If so, can AECOM provide a more substantive explanation than simply referring to the model?

We make a serious mistake when we fall back on the "black box" response (slides 15-17 in the AECOM Power Point) that the "model says" such and such will happen based upon algorithms developed by long experience over time. Residents directly affected by any major decision to shunt traffic flows through their streets—not to mention Council Members and the Planning Board— inevitably will ask questions about real-world factors and assumptions behind any projections. They'll expect *concrete* responses based upon realities they can understand, not generalized descriptions of how the traffic model works.

An actual count would provide the best answer, but because customary traffic patterns are disrupted, construction of the Arts and Transit District would distort a count's reliability at this time.

Table 2 attempts an alternative estimate, but may be just as questionable. Nonetheless, it seems reasonable to assume that the hospital move probably *did* lower PM peak traffic on Alexander by at least 650+—and perhaps as many as 890—vehicles.

[1] Our present focus here is upon commuters and peak traffic rather than *overall* traffic volumes. Despite a decline of +/-2000 in commuter traffic in Princeton since 2006, overall traffic will certainly continue to increase.

Table 1
Traffic Count in Both Directions on Alexander Road
Between Faculty Road and University Place
2010 (DVRPC Count) and 2012 (AECOM Estimated) Compared

Hour Beginning	2010 DVRPC	2012 AECOM	Difference
Midnight	112		
1 a.m.	54		
2 a.m.	17		
3 a.m.	24		
4 a.m.	233		
5 a.m	713		
6 a.m.	1,581		
7 a.m.	AM Peak 2,022		
8 a.m.	1,522		
9 a.m.	1,066		
10 a.m.	1,037		
11 a.m.	1,155		
Noon	1,162		
1 p.m.	1,087		
2 p.m.	1,463		
3 p.m.	1,608		
4 p.m.	PM peak 1,841	948	893
5 p.m.	1,656		
6 p.m.	1,167		
7 p.m.	763		
8 p.m.	610		
9 p.m.	373		
11 p.m.	239		
Total	**21,579**		
AECOM 2027 Forecast		1,998	
% over 2012 AECOM Baseline		111%	
% over 2010 DVRPC Count	8.5%		

Source: Delaware Valley Regional Planning Commission
Travel Monitoring File #64896, March 1-3, 2010

Table 2 lists the origins/destinations for the Princeton HealthCare System's employees as identified in 2009 by the System's consultant prior to the relocation. Though the PHS consultant attempted to predict their routes to work *after* the relocation to Plainsboro, the table tries to work the numbers in reverse to *very roughly* estimate how they came to work when the medical center was still located in Princeton; then "guesstimate" as of June 2012 how much peak traffic volume would drop on each of Princeton's gateway arteries after these employees shifted their journey to work to Plainsboro. (The 262 medical office employees who relocated are excluded because I have no origin/destination information about them.)

Table 2
"Guesstimated" Reduction in Commuters Resulting From Hospital Relocation
Number and Percent By Gateway Portal
June 2012

Access Artery	*Number*	*% of Total Reduction*
U.S. 1 North/Harrison	*241*	*15.9%*
U.S. 1 South and/or Alexander	*542*	*35.8%*
U.S. 206 North	*106*	*7.0%*
U.S. 206 South	*302*	*20.0%*
Rt. 27	*96*	*6.3%*
Washington Road	*78*	*5.2%*
Rosedale	*91*	*6.0%*
Elm/Great Road	*57*	*3.8%*
Total	**1,513**	

Source: Adapted from Consultant's *Spreadsheets on Traffic Impacts of Hospital Relocation*
Princeton HealthCare System; 2009

These estimates are just as open to question as those generated by AECOM's model.

Details about possible traffic impacts of the hospital relocation are in an appendix to this memo.

#2 Concerns about AECOM's forecasts of *future* traffic growth.

While it is still the leading employment hub for the surrounding area, +/-2000 jobs once concentrated in Princeton have decentralized out of town into surrounding municipalities over the last decade. Despite significant prospects for *increased* growth in employment and traffic in the U.S. 1 corridor is a challenge, projecting future peak traffic volumes in and out of Princeton in light of its decentralizing employment. The forecasts for Princeton summarized in AECOM's current pie chart for 2027 only anticipate a return to peak traffic volumes that nearly approximate those on Alexander in 2010.

We do not know how much of the impact of Princeton University's transfer of several hundred employees to the Carnegie Center in West Windsor has been captured by the census in its 2007-2011 *American Community Survey,* but Table 3 hints at a trend of employment dispersal out of Princeton even before the medical center relocated to Plainsboro in 2012 and reduced the in-town daily workforce by another 1,700-1,900.

Table 3
Census Estimates of Consolidated Princeton Workforce and Commutation Compared*

	2000	2006-2010	2007-2011
Commuting residents	13,531	13,111	12,725
Daily Workforce	32,685	31,379	30,805
In-commuters	26,388	24,551	24,363

Sources: 2000 U.S. Census *Journey-to-Work Survey*;
2006-2010 and 2007-2011 *American Community Surveys.*
** Reduce the daily workforce by another 1,703 in 2012.*

While these shifts may have reduced in-town peak traffic in Princeton, congestion in the U.S. 1 corridor and adjoining towns continues to grow. Even now, a great commuting game of musical chairs takes place as an estimated 115,115 residents of area municipalities leave town to go to work elsewhere each day, while a third again as many commute in from some other place (156,192) to jobs in these same towns; thus the gridlock on U.S. 1 (Tables 4 and 5).

- **Undoubtedly, the "Key Regional Developments" along U.S. 1 cataloged in AECOM's report will generate significant future growth in employment and traffic, but what, if any, are AECOM's assumptions about the connection between them and its forecasted peak traffic on Alexander (in or out)?**
  - Does AECOM anticipate that a significant number of resident Princeton workers will out-commute to these new employment sites, particularly in West Windsor (470/24%)? Then what projected growth in the town's labor force would underpin such an expectation, and does this relate in any way to the new residents in the in-town developments identified in the report?
  - Or are AECOM's West Windsor projections related to continued relocation of university administrative employees to Carnegie Center, most of them not likely to live in Princeton? (So, except at the interchange with U.S. 1, peak hour traffic on Alexander Road seems unlikely to be much affected.)

Table 4
Estimated Resident Employed Over Age 16 and Estimated Out and In-Commuters
Princeton and Adjacent Municipalities, Number and % Change
2000 and 2007-2011 Compared[2]

	Employed Residents 2000	Employed Residents 2007-2011	%	Out-Commute 2000	Out-Commute 2007-2011	%	In-commute 2000	In-commute 2007-2011	%
Princeton	13,531	12,725	-6.0%	7,234	*6,283	-13.1%	25,323	*24,363	-3.8%
E. Windsor	13,664	14,673	7.4%	11,738	12,128	3.3%	6,516	7,292	11.9%
Hightstown	2,951	2,784	-5.7%	2,597	2,371	-8.7%	2,472	2,353	-4.8%
Hopewell B.	1,212	1,028	-15.2%	1,011	853	-15.6%	1,030	1,147	11.4%
Hopewell T.	7,435	8,140	9.5%	6,305	6,672	5.8%	5,001	8,924	78.4%
Lawrence	14,607	17,137	17.3%	11,150	13,211	18.5%	19,083	20,816	9.1%
Pennington	1,294	1,153	-10.9%	985	947	-3.9%	1,783	3,242	81.8%
W. Windsor	10,713	12,379	15.6%	8,635	9,953	15.3%	17,449	19,823	13.6%
Cranbury	1,519	1,657	9.1%	1,290	1,390	7.8%	4,677	6,948	48.6%
Plainsboro	11,923	12,624	5.9%	9,869	10,090	2.2%	12,398	12,614	1.7%
S. Brunswick	19,821	21,640	9.2%	16,344	17,923	9.7%	**24,362**	19,563	-13.6%
Franklin	26,356	30,538	15.9%	21,880	25,361	15.9%	27,597	20,809	-24.6%
Montgomery	8,356	9,597	14.9%	6,906	7,712	11.7%	7,903	8,298	5.0%
Rocky Hill	370	265	-28.4%	341	221	-35.2%	391	N.A.	
Totals	**133,752**	**146,340**	**9.4%**	**106,285**	**115,115**	**8.3%**	**154,255**	**156,192**	1.3%

Source: 2007-2011 *American Community Survey*; Tables B08301 and B08406, NJ County sub-divisions.
2000 *Journey-to-Work Survey*, U.S. Census; Residence and Workplace tables, NJ County sub-division.
* Remember, this is before the medical center relocation.

Table 5
Estimated Number of Resident In-Town Workers and Daily Workforce
Princeton and Adjacent Municipalities Compared, Number and % Change
2000 and 2007-2011[3]

	Resident In-Town Workers 2000	Resident In-Town Workers 2007-2011	% Change	Daily Workforce 2000	Daily Workforce 2007-2011	% Change
Princeton	6,343	6,442	1.6%	31,620	30,805*	-2.6%
Plainsboro	2,054	2,534	23.4%	14,452	15,148	4.8%
S. Brunswick	3,477	3,717	6.9%	26,109	23,280	-10.8%
Lawrence	3,457	3,926	13.6%	22,540	24,747	9.8%
West Windsor	2,078	2,426	16.7%	19,527	22,249	13.9%
Franklin	4,476	5,177	15.7%	32,073	25,986	-19.0%
Montgomery	1,450	1,885	30.0%	9,353	10,183	8.9%
Rocky Hill	29	44	51.7%	420	N.A.	
Hopewell Twp.	1,130	1,468	29.9%	6,131	10,392	65.9%
Hopewell Boro	201	175	-12.9%	1,231	1,322	7.4%
Pennington	309	206	-33.3%	2,092	3,448	64.8%
East Windsor	1,928	2,545	32.0%	8,444	9,837	16.5%
Hightstown	354	413	16.7%	2,826	2,766	-2.1%
Cranbury	229	267	16.6%	4,906	7,215	47.1%
Totals	**27,515**	**31,225**	**13.5%**	**181,724**	**187,643**	**3.1%**

Sources: 2000 *Journey to Work*, U.S. Census and 2007-2011 *American Community Survey*; Tables B08301 and B08406.
*Remember, this is before the medical center relocation.

[2] The declines in Hopewell Borough, Pennington, and Rocky Hill are probably within the American Community Survey's margin of error.

[3] The major declines in South Brunswick's and Franklin's daily workforce appear to be the combined effect of the recession and the fact that residential growth outstripped employment growth in these municipalities during this period.

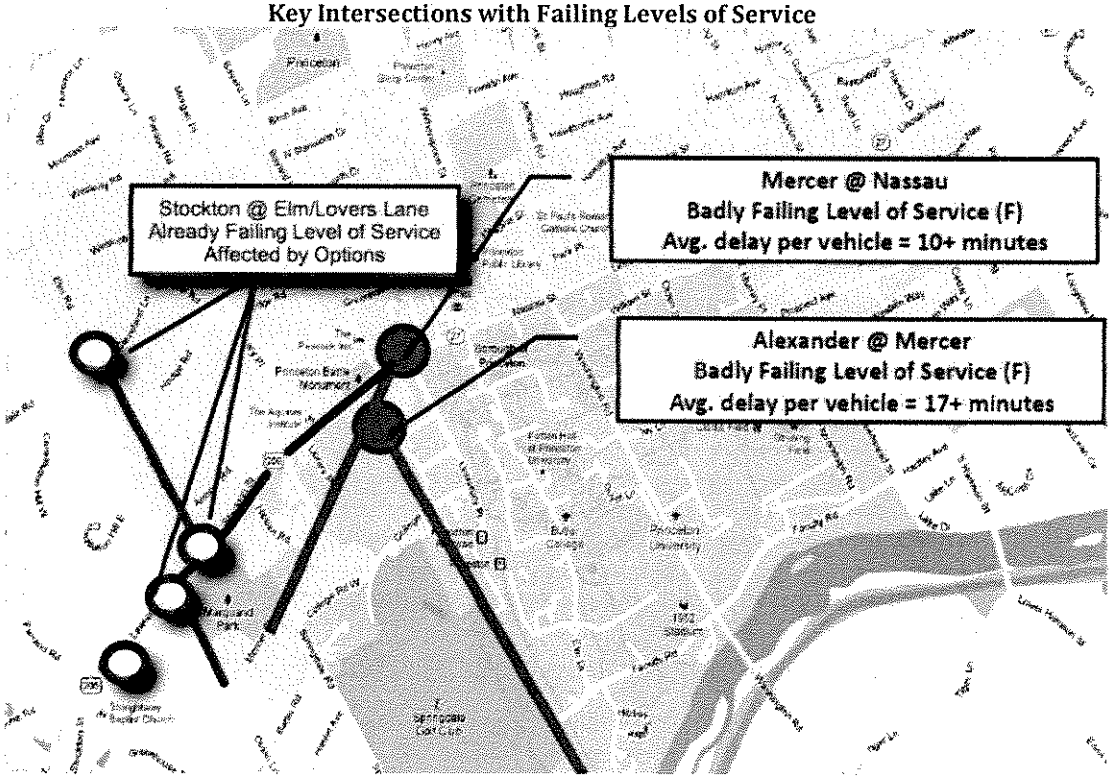
- **How much does AECOM assume consists of peak traffic flowing <u>in</u> to jobs in Princeton and how much of it is traffic flowing <u>out</u> to jobs in the destinations shown in the pie chart? What are the assumed employment destinations in both cases?**
  - The projected increase in university-related traffic (85/4%) appears reasonable, but how does this relate to the projected AM/PM peak projected for the Arts and Transit District under "Updated Land Use and Development Assumptions" on page 19 of the September 25 Task Force meeting document?
  - Correspondingly, should we assume much of the projected 4% growth in traffic (75) between Princeton and Plainsboro consists of out-commutes to the medical center? Much of that has already happened and may even be slightly understated (see appendix).
- **By 2027, AECOM forecasts an increase of 1,040 vehicles in PM peak hour traffic on Alexander over its baseline 2012 estimate. What percentage of the 736 vehicles that AECOM and the Task Force expect to be generated by future in-town developments does AECOM project to contribute to this increase on Alexander?**
  - The Task Force has settled on the assumption that *residents* in these projects will generate roughly 400+ vehicles during the morning and afternoon peak traffic hour and 250-320 in-commutes from elsewhere by *employees* working at these sites. But how many relate to AECOM's forecasted growth in peak traffic volume on Alexander?
    - Two developments are graduate student housing at **Hibben-McGee** and **Merwick/ Stanworth**, neither of which—given the nature of the occupants—seem likely to generate significant peak vehicular traffic on Alexander, other than some working spouses who may either walk, bike, take Tiger Transit, or drive to jobs or take kids to school in town. A small number may out-commute by car or transit, but their contribution to peak hour traffic on Alexander is apt to be quite small.
    - We do not yet know the make-up of those who will take up residence in the 97 town houses at **Hulfish North** (Palmer Square), but it seems unrealistic to expect that more than a few of the 41 of the occupants that the Task Force expects to drive during rush hours will contribute to the projected traffic increase on Alexander.
    - The 280 apartments planned for the redeveloped **hospital site** may generate the 118 rush hour drivers the Task Force expects, but given the hope that many of them will be folks who hold jobs in town, how many does AECOM expect to contribute to volume at the peak on Alexander?
    - Given the uncertain prospects for the YM/YWCA Redevelopment, it seems problematic to project what, if any, contribution the projected 59 resident vehicles and 32 in-commuting employees will make to traffic on Alexander. What, if any, part do these 59 play in the AECOM forecast?
- **Of what are the "Other identified," "Other Regional," and "Princeton General" forecasts comprised? Can AECOM spell out any concrete, comprehensible assumptions that may lie behind these estimated numbers?**
- **On what basis does AECOM imply that a significant percentage of peak hour volume on Alexander is "through" traffic? What are the origins and destinations of commuters who would deliberately choose to thread their way through congested downtown Princeton to get to work? (See the discussion below about some non-Princeton commuters who drive to Princeton Junction.)**

#3. Concerns about impacts of traffic proposals on streets outside of AECOM's "focus areas."

All of AECOM's "focus areas" are east of the intersection of Nassau and Stockton or north on Bayard (US 206). Yet some of the most significant impacts of its proposals to reroute traffic flows—particularly one-way flows on Alexander and Mercer—will impact Mercer below that intersection, Lovers Lane over to U.S. 206 south, and the U.S. 206 junctions at Ferrand and Elm.

AECOM quite appropriately points to the fact that the Mercer/Nassau and Alexander/Mercer intersections have a "badly falling level of service" that will become acute by 2017 (Figure 1). However, during the AM and PM peaks, the U.S. 206/Elm and U.S. 206/Lovers Lane intersections experience similar failing levels that spill south on U.S. 206 to Ferrand. NJDOT will take a particular interest in the systemic consequences for traffic on US 206 that may result from re-directions of traffic on Mercer. For these reasons, these intersections should be added to the "focus areas" in the report.

Figure 1
Key Intersections with Failing Levels of Service



APPENDIX

ADDITIONAL DATA ON IMPACT OF MEDICAL CENTER RELOCATION

At the time of the move, the hospital reportedly had 1,703 employees who commuted by car to work in Princeton. Of these, 161 were Princeton residents. Therefore, the estimated number of Princeton in-commuters declined by 1,542 and the estimated number of out-commuting residents grew by 161. Princeton HealthCare System's traffic consultant counted an additional 262 resident employees in Princeton medical offices who were also likely to relocate to Plainsboro, which further lowers the estimated number of current Princeton in-commuters and increases the number of out-commuters.[5]

So as of June 2012, we can tentatively revise estimated commutation into Princeton (mostly by motorists) downward to 20,007, increase the total number of resident out-commuters to 6,444, and reduce the number of resident in-town workers to 6,281. As noted earlier when we examined AECOM's forecast, these revised numbers alter estimates of *peak* traffic in 2012.

Of course, some medical center employees must still drive through Princeton to get to their relocated jobs in Plainsboro and thus continue to contribute to peak traffic in town. Prior to the relocation, the Health System's consultant tried to estimate their routes. Table A summarizes these expectations in 2009 before the relocation occurred.

Table A
Expected Employee Commutation Routes Via Princeton to Plainsboro Campus
Princeton HealthCare System
As of 2009

Origin	Total Number	S. Harrison and U.S. 1	Alexander and U.S. 1	Rosedale/Province Line/ U.S. 1
Princeton	161	81	80	
Hillsborough	38	38		
Pennington	36	36		
Belle Mead	30	30		
Skillman	17	17		
Hopewell (Twp/Boro)	17		8	9
Kingston	3	3		
Rocky Hill	3	3		
Basking Ridge	3	3		
Manville	3	3		
Titusville	3			3
Totals	**314**	**214**	**88**	**12**

Source: Consultant's *Spreadsheets on Traffic Impacts of Hospital Relocation*
Princeton HealthCare System; 2009
*Many possibly used Rosedale/Province Line rather than Alexander.

Inevitably, the health system's relocation has had a still greater impact on non-peak traffic—1,070 fewer daily incoming hospital visitors, 40 fewer trucks, and a currently unknown lesser number of emergency vehicles. On average, +/-300 Princeton residents now are estimated to leave town each day for a trip to the relocated center. Table B lists routes in-patients were expected (in 2009) to use on their way to the new Plainsboro campus over the course of a year.

[5] Consultant's *Spreadsheets on Traffic Impacts of Hospital Relocation*, Princeton HealthCare System; 2009.

Table B
Expected In-Patient Routes Via Princeton to Plainsboro Campus
Princeton HealthCare System
As of 2009

Origin	Total	% of Total Patients	Via S. Harrison/ U.S. 1	Via Province Line or Alexander/U.S. 1
Princeton	2,488	21.3%	1,244	1,244
Pennington	410	3.5%		410
Skillman	311	2.7%		311
Belle Mead	213	2.0%		213
Hillsborough	173	1.5%		173
Hopewell*	142	1.2%		*142
Rocky Hill	31	.3%		31
Total	**3,768**	**32.5%**	**1,244**	**2,524**

Source: Consultant's *Spreadsheets on Traffic Impacts of Hospital Relocation*
Princeton HealthCare System; 2009 * Township and Borough; may use Province Line or Rt. 518

Now that the relocation has actually occurred, these numbers are up for substantial revision. The Princeton Health System reports that most residents in Hopewell Borough and Township have shifted their care to Capital Health in Ewing.[6] Other communities to the west/north of U.S. 1 and Princeton may also have done so.

If this is the case, the amount of traffic traveling through Princeton en route to the Plainsboro medical campus is considerably less than originally expected.

For the present, we can "guesstimate" that the relocation may have reduced total in-town car and truck traffic by about 5,752 trips per day (since most trips are round trips). A more accurate estimate awaits more recent traffic counts.

Table 5
"Guesstimated" Aggregate Reductions in Princeton Daily Traffic From Hospital Relocation

	Estimated Reduction	# Round Trips
Hospital employee commuters	1,542	3,084
Medical Office employees	262	524
Daily Patients/Visitors	1,017	2,034
Trucks	40	80
Emergency vehicles	?15	?30
Totals	**2,876**	**5,752**

Source: Consultant's *Spreadsheets on Traffic Impacts of Hospital Relocation*
Princeton HealthCare System; 20
?No actual counts available at this writing.

[6] Pam Hersh, Princeton HealthCare System.

ADDENDUM B

January 7, 2014

To: Kevin Wilkes, Chair, ASUP Task Force
cc: Kristen Appelget, Nat Bottigheimer, Kim Jackson, Robert Kiser, Lance Liverman, Pat Simon, Lee Solow, Jack West, Anton Lahnston, Marvin Reed.
From: Ralph Widner
Subject: URS Reports and Task Force Work To Date

Introduction

Attached are areas of serious concern that URS and the Task Force should examine. My comments are intended to elicit rebuttals and more substantive and transparent explanations from URS. So far, we have pretty good reports on transit options but they rest upon very wobbly, opaque, and deficient analyses of markets for transit without which it will be almost impossible to secure public support to attract funding to expand transit.

Though URS' tasks are far from completed, the transit options they have outlined pretty much define the *physical* possibilities for transit from the Dinky station to Nassau. You have already, quite properly, ruled out extension of heavy rail up to Nassau, but in my view, you have approached the whole matter backend-to. Before looking at physical possibilities to accommodate various transit technologies, you should have first defined the ridership and markets you want to serve. I realize this all may yet come, but why run out the budget proposing solutions before you have defined either the markets you want to serve, or the problem you want to solve?

There will be some temptation—already reflected in one of the questions at the November briefing—just to do nothing and wait and see what happens. I fully subscribe to the study's "bottom line" conclusion that "doing nothing is not an option," since many of the forecasted problems are already, or nearly, upon us. Alas, we (NJDOT, Princeton, and nearby municipalities) undertake these studies at considerable expense (e.g., *DVRPC, U.S. 1 EIS, U.S. 206 Vision Study, Route 1 Regional Growth Study*), then leave them on the shelf for "lack of political will," only to fund still another study a few years later. Purported prescriptions for action turn into stalls for time and we continue to stumble into the future. We can hope that this unique collaboration can do better than that and help galvanize a more far-reaching, financially feasible strategy to reduce congestion and enhance mobility in the entire area and thereby help preserve and improve its future quality of life and economic vibrancy, an objective in the long-range interest of both the community and the university.

As it stands at present, the PowerPoint pie chart in the URS presentation showing how Princeton residents get to work is almost irrelevant. It says nothing about those coming *in* to Princeton jobs from elsewhere—nearly four times the number of residents leaving for jobs out of town and the major source of our peak traffic. It is equally silent about the use of transit by those coming *in* to work. With respect to resident workers, it fails to distinguish between those who drive to in-town jobs and those who drive out-of-town to work. Such information is critical if we are to assess the markets (and secure funding) for increased transit.

As already stated, employment and peak commutation into Princeton may be decreasing, not increasing. Rather than pie charts, let's use tables so that we can eye the details. Table 6 summarizes the census' 2007-2011 *American Community Survey* (the same source URS used for its pie chart). Note that about a fourth of the 5,726 residents who drive alone to work are driving to in-town jobs. Some may be candidates for in-town transit, but certainly not for transportation to Princeton Junction. Later we'll deal with how many resident out-commuters may be potential converts to transit.

Table 6
Estimated Resident Princeton Commuting Employed Over Age 16
Mode For Going To And From Work, 2007-2011

	Princeton	%	M/E	NJ %	U.S. %
Resident Commuters	**12,725**		+/-419		
Worked in town	**6,442**	**50.6%**			
Worked at home	1,371	10.8%	+/-224	3.6%	4.2%
Walked to work	2,905	22.8%	+/-429	3.2%	2.8%
Biked to work	530	4.2%	+/-147	.3%	.5%
Drove alone to in-town job	1,467	11.5%	+/-73	75.8%	76.1%
Carpooled	169	1.3%	+/-9	9.3%	10.2%
Worked elsewhere	**6,283**	**49.4%**			
Drove alone on out-commute	4,259	33.5%	+/-213	75.8%	76.1%
Out-commuted by Carpool	494	3.9%	+/-25	9.3%	10.2%
Used Transit	1,346	10.5%	+/-210	10.7%	5.0%
Rail	898	7.1%	+/-178	2.5%	.5%
Bus	324	2.5%	+/-102	6.2%	2.6%
Transfers	124	1.0%		2.0%	1.8%
Subway	66		+/-57		
Ferry	46		+/- 74		
Trolley	12		+/-20		
Taxi/ Other modes	184	1.4%	+/-46	1.7%	1.2%

Source: 2007-2011 *American Community Survey; Tables B08406, B08301, and B08009*

As noted already, missing from the URS pie chart is the largest source of peak commuter traffic—*non-residents* who drive in to Princeton jobs (Table 7). Remember from Table 6 that an estimated 1,461 Princeton residents drove alone to in-town jobs each day. That means that of the 21,811 commuters who drive to work in Princeton each day, an estimated 20,350 drove in from elsewhere in 2007-2011. And despite the far greater numbers of these in-commuters compared to resident out-commuters, considerably fewer than half as many in-commuters came by rail and almost three times as many came by bus. (We'll return later to the question of how many in and out-commuters who used rail transit also used the Dinky.)

Table 7
Princeton Daily Workforce Over Age 16
Mode of Going to and From Work 2007-2011

	Princeton	Percent	M/E	New Jersey %	U.S. %
Daily Workforce	**30,805**				
Princeton Residents	**6,442**	20.9%			
In-Commuters	**24,363**	79.1%			
Drove alone	21,811	70.8%	+/-994	71.7%	76.1%
Carpooled/van/shuttle	2,431	7.9%		8.8%	10.2%
Worked at home	1,371	4.5%	+/-168	3.6%	4.2%
Walked to work	2,897	9.6%	+/-417	3.2%	2.8%
Biked to Work	540	1.8%	+/-194	.3%	.5%
Used Transit	1,387	4.6%	+/-249	10.7%	5.0%
Bus	889	2.9%	+/-232	6.2%	2.6%
Railroad	438	1.5%	+/-68	2.5%	.5%
Transfers					
Subway	60	.2%	+/-67	2.0%	1.8%
Taxi/Other modes	368	1.2%	+/-65	1.7%	1.2%

Source: 2007-2011 *American Community Survey*

Obviously, the numbers in Tables 6 and 7 are outdated because of the Princeton HealthCare System move to Plainsboro in 2012. At the time of the relocation, the hospital reportedly had 1,703 employees who commuted by car to work in Princeton. Of these, 161 were Princeton residents. Therefore, the estimated number of Princeton in-commuters declined by 1,542 and the estimated number of out-commuting residents grew by 161. Princeton HealthCare System's traffic consultant counted an additional 262 resident employees in Princeton medical offices who were also likely to relocate to Plainsboro, which further lowers the estimated number of current Princeton in-commuters and increases the number of out-commuters.[1]

So as of June 2012, we can tentatively revise estimated commutation into Princeton (mostly by motorists) downward to 20,007, increase the total number of resident out-commuters to 6,444, and reduce the number of resident in-town workers to 6,281. As noted earlier when we examined AECOM's forecast, these revised numbers alter estimates of *peak* traffic in 2012.

Despite the downward trend in the number of Princeton in-commutes, the community undoubtedly wants to see the present volume of vehicular traffic reduced—a draft objective in the community's Master Plan.

Clearly, one of the major tools at our disposal to achieve such a reduction is to expand the availability of convenient, reliable, and affordable transit. Presumably, the remaining assignment for URS is to help us identify financially feasible options to that end. However, notwithstanding efforts at the outset of its work to define its goals and objectives, the Task Force apparently expected URS to focus first on physical and technological options for transit between the Dinky station and Nassau and the Dinky station and Princeton Junction, rather than to first identify the ridership and markets the Task Force wants to serve. By doing the study backwards, the Task Force may discover that the identified physical and technological options will prove financially infeasible, e.g.—

[1] Consultant's *Spreadsheets on Traffic Impacts of Hospital Relocation*, Princeton HealthCare System; 2009.

- Is our objective in moving access to the Dinky (or whatever replaces it) up to Nassau Street simply to make the train more convenient and accessible for those who presently use it in order to assuage their anger over the station's relocation? If so, we face an almost impossible sell to attract funding for any major infrastructural connections because we will be unable to cite any expansion in ridership to warrant the investment. Lacking that, the only feasible option will be to improve and extend shuttle services via Tiger Transit and the FreeB.

- Or do we harbor the hope, by extending service up to Nassau Street, that we can attract enough *additional* ridership to make a major physical extension financially feasible? Presumably URS is to provide the Task Force with an analysis that will indicate whether that hope is justified, one way or another. Though I'd love to be proven wrong, any increases in ridership that access from Nassau Street might generate for transit that only serves Princeton Junction and downtown Princeton are probably modest at best simply because that step alone will not make the Dinky any more convenient and efficient for them than it is at present.

- Or might we be prepared to propose the Princeton-Princeton Junction rail line as a key spine for a future multi-modal *area* transit system that serves a larger and more diverse set of riders than simply those who wish to catch a Northeast Corridor train? This could lay the foundation for a more financially viable system and also help reduce vehicular traffic in the Alexander and U.S. 1 corridors. [An outcome completely consistent with AECOMM'S and URS' previous analyses in the NJDOT 2010 *U.S. 1 Regional Growth Study.*]

Current Dinky Use

URS' analysis of Dinky ridership is based upon the best available data (B.A.D.) we have at this time—a survey of riders conducted by CHANCE Management Advisors for Princeton University in 2006/2007, and 2012 ridership surveys by New Jersey Transit. Table 8a below combines some of this data with commuter rail ridership in 2007-2011 estimated by the U.S. Census' *American Community Survey* together with a slightly different set of ridership data gathered from New Jersey Transit by New Jersey Future in 2012. Because all of these data were collected in different years by different methods, they can support only *very rough* judgments about current Dinky use by commuters and potential markets to expand ridership.

In order to avoid double counting—and assuming that most trips are round trips—the New Jersey Future study counted "boardings" only at the station of origin, e.g. out-commuters are counted in the morning and in-commuters in the evening. Consequently, the estimates in Table 8a correspond to the volume in only one direction rather than both, as in the URS table. (There are, of course, some one-way riders, but the percentage is assumed to be small.)

To help gauge the potential market for expanded ridership, the trick is to determine how many Princeton Northeast Corridor commuters are *not* using the Dinky to get to and from Princeton Junction; then attempt to judge why. We can try to infer a "guesstimate" using the 2007-2011 *American Community Survey,* and then compare it to specific data from the West Windsor Parking Authority. By good fortune, Rodney Fisk has obtained data from the latter for just such a purpose.

Table 8a is premised on the *American Community Survey* estimate that 898 Princeton residents out-commuted and 438 in-commuted by rail for a total of 1,336 during 2007-2011. Then we infer how many used the Dinky to get to and from Princeton Junction by subtracting from that total the percentages of various users identified in the CHANCE Management Survey (the same survey used by URS). This requires that, using the CHANCE survey, we separate the riders labeled "Not Affiliated" in the URS pie chart into "daily commuters", "non-daily commuters", and "casual users". Keep in mind that some of the commuters are university-related, so the percentages will differ from those in the URS pie chart.

Table 8a
"Guesstimated" Princeton Northeast Corridor Weekday Rail Riders Who Used the Dinky
2006-2012

Estimates	Number	Percent
Average total daily boardings @ Dinky Station	1,012	
Daily commuters	425	42%
Non-daily commuters	273	27%
Total average commuter Dinky boardings	**698**	52.2%
Total Princeton NE Corridor rail commuters	**1,336**	
Inferred number commuters not using Dinky	**638**	48%
Casual users (1-3 month)	314	31%
University-related	405	40%
Non-university related	607	60%
Walked to Dinky station	*455*	*45%*
Drove & parked at Dinky station	*283*	*28%*
Dropped off	*101*	*10%*
Taxi	*92*	*9%*
Biked	*51*	*5%*
Carpool/shuttle	*40*	*4%*

Sources: New Jersey Future, *Targeting Transit: Assessing Development Around New Jersey's Train Stations*; Sept. 2012.
CHANCE Management Advisors, Inc., *Survey of Ridership on the Dinky for Princeton University*; October 2006.

Data secured by Rodney Fisk from the West Windsor Parking Authority (Table 8b) more or less to validates the "guesstimate" that only about half of rail-riding Princeton resident commuters use the Dinky to get to Princeton Junction. Postal code 08540 embraces a good bit of territory outside of Princeton, including parts of West Windsor, Lawrence, Montgomery, Franklin, and Plainsboro. If we make allowances for that, the "guesstimate" that about 638 rail-using resident Princeton commuters opt to drive to Princeton Junction rather than take the Dinky is probably not too far off the mark. The remaining 127 West Windsor permit holders are presumed to reside in one of the other communities in the 08540 zip code area. The resident population in postal code 08542 is quite small, since it mostly encompasses Princeton's business district. Nevertheless, it is disturbing that 16 residents in downtown Princeton (08542) would choose to drive to West Windsor to catch the train, since they are within easy walking or shuttle/bus distance of the Dinky station.

It is conceivable that the 211 commuters residing in Hopewell, Pennington and Montgomery who park at Princeton Junction and are listed in Table 8b would account for some or most of the so-called peak hour "through" traffic ostensibly included in AECOM's analysis of traffic on Alexander.

Table 8b
Permits Issued at Princeton Junction Parking Lot in West Windsor
By Postal Code

Area and Postal Code	Number of Permits
Hopewell Boro area (08525)	18
Princeton & parts of W. Windsor, Lawrence, Montgomery, and Plainsboro (08540)	765
Downtown Princeton (08542)	16
Bedens Brook, Blawenberg/Skillman (08558)	111
Pennington area (08534)	82

Source: West Windsor Parking Authority; December 2013 to Rodney Fisk

How likely is it that a significant percentage of these 638 resident Northeast Corridor commuters who do not currently use the Dinky, would decide to take the Dinky if they could gain convenient access on Nassau? Since most live outside the downtown core, it is unlikely that access from Nassau alone would induce them to shift to the Dinky. Are we able to identify other potential targets to expand rail use, including the Dinky, by Princeton's in and out commuters?

Table 9 sketches some possible targets for study, and some of the challenges we face to convert them from driving to transit. Tables 10-12 provide some underpinning, but outdated data.

Table 9
A Sketch of Potential Target Markets for Near-Term Expanded Transit in Alexander Corridor

Potential Market	Issues
+/-638 Princeton Northeast Corridor current rail out-commuters who do not use the Dinky (Table 8a).	•**Location:** May live too distant from station to walk or use local transit. •**Time:** Inconvenient 3-4 seat commute. •**Time:** Unreliable connections between Dinky & NJ Transit trains. •**Preference:** Choose to commute by bus.
+/- 420 Princeton Northeast Corridor current out-commuters who *do not* use rail (Table 8a).	•**Time:** Many commuters to Philadelphia and other NE corridor destinations may find rail connections too time consuming and inconvenient compared to driving. • **Location:** Princeton residence too far removed from Dinky station to be convenient. • **Location:** Place of work too remote from a destination station.
+/-114 Princeton Northeast Corridor in-commuters who do not use rail (Table 8a).	• **Location:** Residence may not be conveniently accessible to rail. • **Location:** Workplace may not be conveniently accessible from Princeton Junction. • **Cost:** Princeton in-commuters have lower incomes than its out-commuters, so cost becomes a factor.
+/-3,500 Princeton and West Windsor commuters who live in one municipality and work in the other (Table 11).	• **Location:** Residence may not be conveniently accessible to stations. • **Location:** Workplace may not be conveniently accessible from stations.
+/- 4,826 Princeton, Plainsboro, and South Brunswick commuters who live in one of the municipalities and commute into or out of Princeton (Table 11).	• **Location:** Residence may not be conveniently accessible to stations. • **Location:** Workplace may not be conveniently accessible from stations. • **Investment:** U.S. 1 station on Dinky line required. • **Investment:** Shuttle/jitney service to major employment sites.
+/-300 patients/visitors to medical campus in Plainsboro (Appendix).	• **Investment:** U.S. 1 station on Dinky line required. • **Investment:** Frequent jitney service.

Sources: 2007-2011 *American Community Survey* and 2000 *Journey to Work* Census

Table 10
Estimated Total In and Out-Commuters
Princeton and Adjacent Municipalities
Northeast Corridor
2000

	In-Commuters to Princeton	Out-Commuters from Princeton
New York City total	**308**	**723**
Manhattan	*108*	*654*
Brooklyn	*63*	*51*
Queens	*39*	*8*
Bronx	*24*	*10*
Staten Island	*74*	*0*
Secaucus	0	0
Newark	22	93
Elizabeth	7	0
Linden	0	0
Rahway	11	25
Metuchen	43	23
Edison	154	97
New Brunswick	158	266
Philadelphia	214	97
Wilmington, DE	19	0
Baltimore, MD SMSA	22	0
Washington, DC SMSA	23	11
Total in 2000	**981**	**2,085**
Total Rail Transit Users 2007-2011	**438**	**898**
Total Bus Transit Users 2007-2011	**889**	**324**
Transfers		
Subway/elevated		66
Street car		12
Ferry		46

Source: 2000 *Journey to Work* Census and 2007-2011 *American Community Survey.*

Table 11
Inter-Commutes Between Princeton Area Municipalities
2000

	East of U.S. 1	Across U.S. 1	West of U.S. 1
Princeton-Plainsboro		2,520	
Princeton-South Brunswick	220	2,306	
Princeton-Lawrence	4,589	307	
Princeton-West Windsor		3,484	
Princeton-Franklin	*1,272		
Princeton-Montgomery	2,422		
Princeton-Hopewell*	2,764		
Princeton-East Windsor**		1,886	
Princeton-Cranbury		242	
Plainsboro-South Brunswick		134	3,000
Plainsboro-Lawrence		1,636	212
Plainsboro-West Windsor		332	2,776
Plainsboro-Franklin		1,150	
Plainsboro-Montgomery		1,164	
Plainsboro-Hopewell		618	
Plainsboro-East Windsor			1,560
Plainsboro-Cranbury			444
South Brunswick-Lawrence		*1,089	117
South Brunswick-West Windsor		*818	818
South Brunswick-Franklin	2,001	2,000	
South Brunswick-Montgomery		1,188	
South Brunswick-Hopewell		596	
South Brunswick-East Windsor			2,824
South Brunswick-Cranbury			424
Lawrence-West Windsor		2,322	
Lawrence-Franklin		460	
Lawrence-Montgomery	1,010		
Lawrence-Hopewell	2,568		
Lawrence-East Windsor		1,542	
Lawrence-Cranbury		188	20
West Windsor-Franklin		926	
West Windsor-Montgomery		858	
West Windsor-Hopewell		1,038	
West Windsor-East Windsor			2,128
West Windsor-Cranbury			268
Franklin-Montgomery	1,398		
Franklin-Hopewell	284		
Franklin-East Windsor		554	
Franklin-Cranbury		98	
Montgomery-Hopewell	1,158		
Montgomery-East Windsor		434	
Montgomery-Cranbury		308	
Hopewell-East Windsor		376	
Hopewell-Cranbury		72	
Estimated Total	17,881	32,916	14,477
Percent of Princeton Area Commutes			

Source: Adapted from 2000 Journey to Work Census; Place of Residence and Geography of Workplace Tables
* Hopewell includes Township and Borough plus Pennington. **East Windsor includes Hightstown***Montgomery/Rocky Hill.
Red: Existing direct connection by rail.
Blue and **Brown**: Possible commuter multi-modal connections via Dinky and proposed U.S. 1 transit.

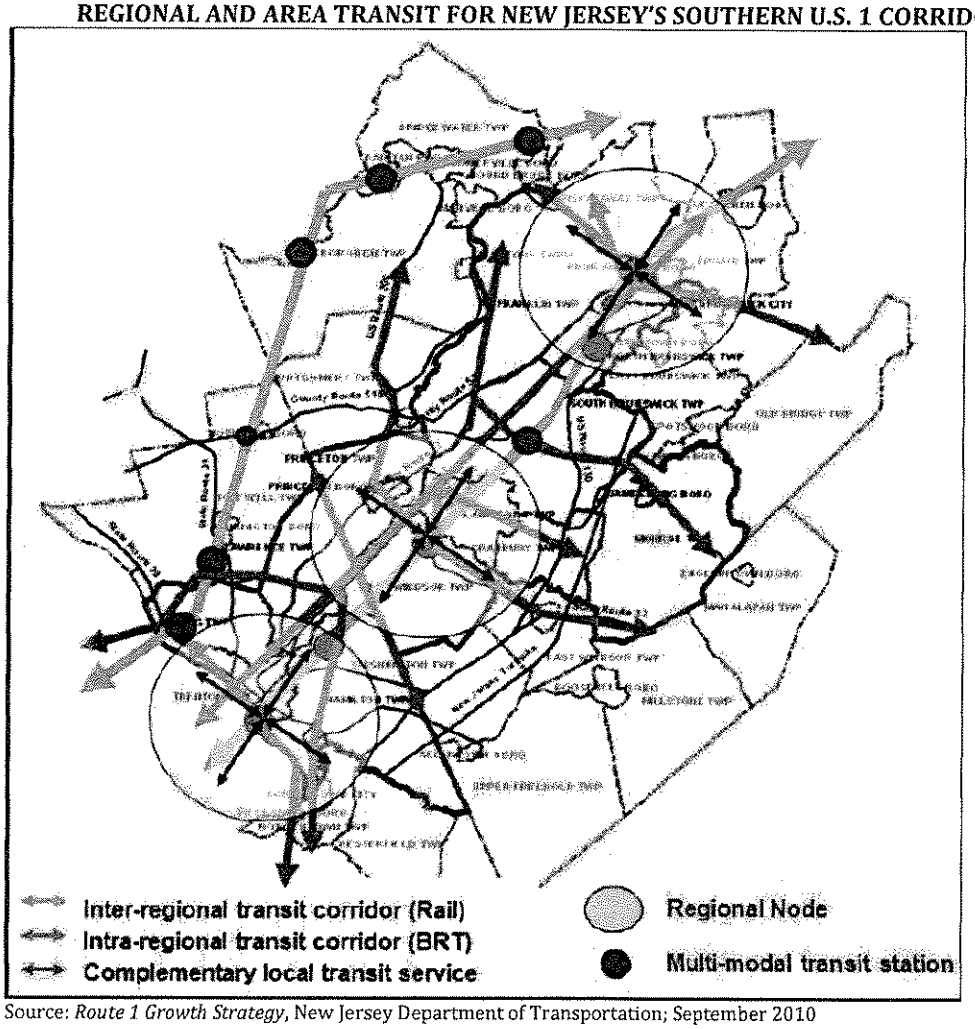
Similar analyses can/should be done for medical center and major shopping destinations.

Though the Task Force's charge is to come up with proposals only with respect to the Alexander corridor, that corridor is a key piece in a much larger traffic and transit puzzle. If your recommendations paint a clear and actionable course that leads toward the larger solutions we require, the Task Force can help galvanize a more far-reaching, financially feasible transit solution that would expand ridership on the Dinky, help reduce vehicular congestion, and enhance mobility in the entire "Greater Princeton" area, and thereby help preserve and improve future quality of life and economic vibrancy. These are goals shared by the university and the community as a whole.

Much of the conceptual groundwork for such a transit system has been laid in the NJDOT-sponsored *2010 U.S. 1 Regional Growth Strategy,* for which AECOM and URS provided much more complete and supportable analysis. Though Franklin is the only municipality in the U.S. 1 corridor to officially adopt it, the strategy's general aim to lure more commuters out of their cars and onto transit is incorporated in the draft Circulation Element of Princeton's draft Master Plan.

The strategy calls for a regional transit system within the U.S. 1 alignment, supplemented by three area transit systems that service riders across and to either side of U.S. 1. One of those systems would be centered on the Princeton area. The Dinky rail line can is its spine (Figure 2).

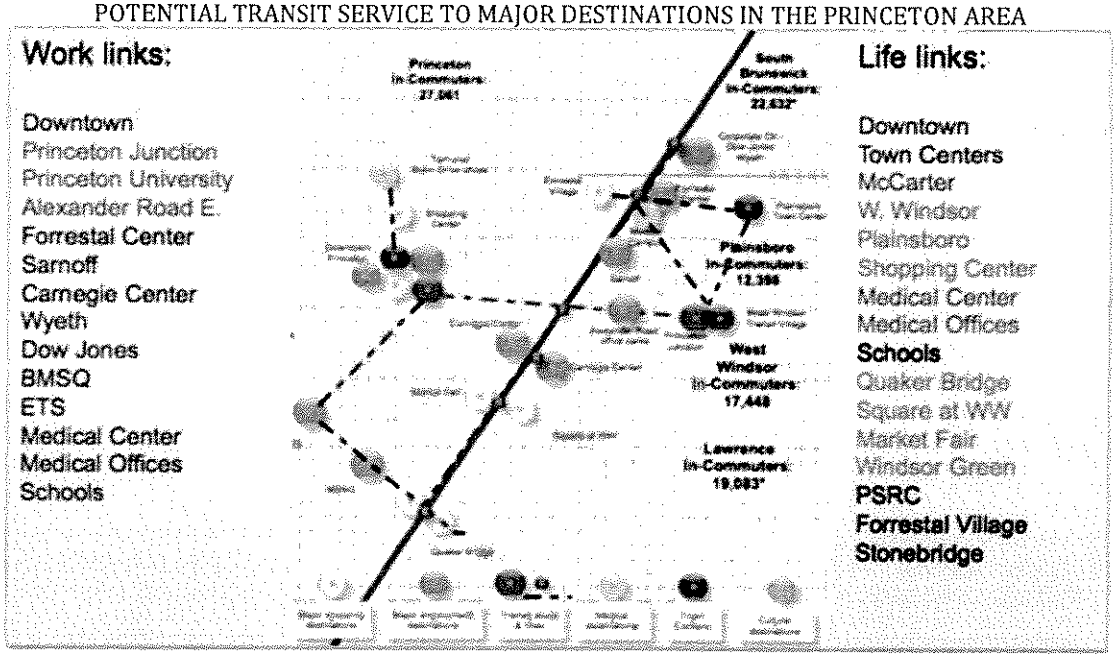
Figure 2
REGIONAL AND AREA TRANSIT FOR NEW JERSEY'S SOUTHERN U.S. 1 CORRIDOR



Source: *Route 1 Growth Strategy*, New Jersey Department of Transportation; September 2010

By interconnecting with the proposed main north-south transit line, the Dinky line could attract a much more diversified ridership bound for many more destinations beyond the peak traffic hours than Princeton Junction: major employment sites, shopping concentrations, and the medical center clients (Figure 3).

Figure 3
POTENTIAL TRANSIT SERVICE TO MAJOR DESTINATIONS IN THE PRINCETON AREA



While the fiscal and political climate at the state level may not be propitious to move such a proposal forward at present, we should plan in a 10-20 year time frame. A clear vision and plan pursued by all the affected municipalities over time can generate "bottom up" pressure to win eventual state action.

Princeton—both the community and the university—is ideally positioned to exercise leadership and to articulate a vision and plan and the first steps toward actualizing such a plan. The Task Force can propose an initial step to create an area transit system by suggesting that a new stop be created on the Dinky Line at U.S. 1 to be served initially by shuttle/jitney services that link the new station to major employment, shopping, and medical sites along U.S. 1. The proposed U.S. 1 transit line eventually would supplant these jitney/shuttle services.