Proposed Research Program to Explore
Strategies for the Functional Classification of
Transit Services in Florida

Prepared for
Florida Department of Transportation

Prepared by
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College of Engineering
University of South Florida
Tampa, Florida

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Proposed Scope of Work

Purpose

The Florida Department of Transportation’s (FDOT) Public Transit Office (PTO) seeks to retain the services of university research faculty to develop a statewide functional classification of transit services. The purpose of the project is to develop a transit service classification system that would help state and local government agencies to better focus their transportation resources. The transit services classification system would be analogous to the roadway classification system which classifies roadways by function (local, collector, arterial, etc.) and jurisdictional “ownership” (state, county, city).

This project consists of three parts. The first part will explore and propose strategies for classifying transit services by type, function and jurisdictional interest. Such a strategy(s) would establish a hierarchy of transit service types based on a defined set of criteria such as operational and service characteristics. It would also develop criteria for categorizing transit services in terms of the level of interest and priorities of the various levels of government: state, regional, and local. For example, services which provide access to major ports and terminals would be deemed to perform a function of statewide significance and therefore, of particular interest to the state.

The second part of the project is to apply the classification scheme developed in part 1 to the classification of transit services within a case study MPO area or FDOT district. Because of the diversity of modes and service types operating in the Miami-Dade MPO area in FDOT’s District 6, that area has been selected to serve as the case study area for this project. Although a large metropolitan area such as Miami-Dade would be used as a case study area, it is expected that the service classification system resulting from this project should be flexible enough to be effectively applied in smaller areas.

The third part of the project will conduct a feasibility study of how transit funding can be tied to the functional classification of services. This will involve establishing a relationship or rational nexus between service classification and funding priorities. The expected results of this part of the project are policy recommendations on the linkage between service classification and funding, including the pros and cons of such a linkage.

BACKGROUND:

The functional classification of transit services was identified by members of the
Transit 2020 Advisory Committees as being critical to helping Florida’s transportation funding agencies and partners better focus their resources. The committees recommended that the classification of transit services be developed as the linchpin of the plan.

The concept of functional classification is common for roadway systems, however its use is not standard practice in public transit. The federal government does not use such a system as a basis for federal aid allocation for transit and the literature does not indicate that the modest number of states that provide operating funding use functional classification strategies for funding allocation. There are, however, cases where transit services have been classified for descriptive and evaluation purposes by a number of characteristics. It is relatively common for transit properties to group bus routes by type in order to evaluate performance. In some cases funding is allocated based on performance of a functional class of routes. For example, indicators such as farebox recovery ratio or passenger trips per service mile might be used for service funding eligibility. Other agencies have explored performance incentives as part of funding formulas where change in performance or progress toward a goal might be the basis for funding support. Absolute performance by a functional class is sometimes the basis for the continued support of the current level of service. Extensive literature on service standards for transit service are documented in the report, “Bus Route Evaluation Standards”, TCRP Synthesis 10. 1995, and applications in Florida are reviewed in “Miami-Dade Transit Agency Service Guidelines”, Final Report, January 1998, CUTR. Forthcoming documents on transit levels of service also address performance expectations for various transit services. There are, for example, different performance expectation for routes that operate as feeder routes or circulator routes compared to radial routes or express routes. These same classifications schemes are useful for descriptive purposes.

In exploring functional classification of routes, the objective will be to identify a variety of ways of classifying routes using characteristics that logically differentiate between routes. The ultimate value of a functional classification strategy has to be to differentiate routes or services such that this information base might enable performance evaluation or funding allocation in a manner that will enhance the attainment of the objectives of the level of government doing the classification.

The purposes of functional classification will be explored in this research effort and this will build on the exploration of this subject that occurred in the development of the Florida Transit 2020 Public Transit Strategic Plan.

WORK SCOPE:

The three parts referenced above and the ten tasks referenced in the request for proposals have been the basis for the design of the following work program. As
proposed, the sequencing of the tasks has been shifted slightly to correspond with deliverable points and key policy decision points. If selected, this work program can be modified to incorporate client feedback before a contract is issued.

Task 1. Literature Review - This task will involve an in-depth literature review on how transit services have been classified within and outside Florida at the federal, state and local levels. This literature review will form the background data base from which the candidate strategies for classification will be developed. Criteria and purposes of classification will be identified with specific interest in cases where classification has been tied to funding. Issues such as the data needs and availability, the level of detail required (For example, are route segments looked at, is relative mileage or passenger miles by type of roadway or trip purpose considered?), the stability of the measure (might it shift with every seasonal schedule change?) and the precision of the data will be considered. The cost and frequency of data base updates and the administration of the functional classification system will be reviewed in identified examples.

Task 2. Review Functional Classification of Other Modes - Roadway functional classification systems at both the state and federal levels will be reviewed for what we can learn from those systems, including an assessment of their actual performance. Airport and perhaps rail or other mode classification systems will also be reviewed in an effort to understand the issues and information requirements necessary to support a functional classification strategy.

Task 3. Stakeholder Interviews - This task will conduct a stakeholder interview of FDOT, MPO and transit agency representatives to obtain their input. Based on preliminary inquires, expectations about the purpose of functional classification of bus services range from the hope that it can more precisely target State funds to support those services of critical interest to the State to the expectation that it can lead to a basis for arguing that State funding levels for some types of transit service should be supported as the same subsidy rate as State owned roadway facilities. Others see bus service classification as an extension of the roadway and airport classification strategies currently in place and a logical next step to be explored in our efforts to treat all modes similarly. This vision might include being able to flex funding between modes and operating and capital categories depending on the functional purpose of the travel corridor. This task will explore the underlying expectations. The interviews will serve to assess expectations as well as gauge issues such as data availability and criteria preferences. Approximately 21 interviews will be scheduled split between agency types and urban area size and location. If deemed appropriate by FDOT, it may be desirable to explore this concept with Transportation Commission staff, Transportation Disadvantaged Commission staff, Florida Transit Association staff or Senate and House transportation committee staff at the stakeholders interview stage or perhaps later in the project.
Task 4. **Project Panel** - Working with FDOT, a project panel consisting of FDOT, MPO and transit agency staff will be selected to provide input to the project. This group will also include Ed Mierzejewski who will bring his expertise in roadway functional classification and Joel Volinski who served as chairman of the Strategic Planning advisory committee. Some of the committee members will be those individuals interviewed in the prior task. The committee will review deliverables and serve to provide guidance to the project team and FDOT concerning the study and subsequent implementation considerations. Efforts will be made to involve the project panel so that they feel a vested interest in the outcome and are supportive of decisions that are made both during the study and at its conclusion regarding application. Sensitivity to urban area size, geographic location in the state, entities with varied combinations of transit modes and other factors will be considered in the selection of the Panel. A panel size of about 28-32 is anticipated.

Task 5. **Technical Memorandum One** - The first technical memorandum for this project will be prepared after the first four tasks have been carried out. This technical memorandum will document the findings in the early tasks, outline subsequent efforts and note work program course changes, if any, that have been jointly decided on. This memorandum will include recommendations on what criteria will be used in the Task 7 functional classification of transit services in Miami-Dade County.

Task 6. **Develop Classification Criteria** - This task will develop classification criteria and alternative ways of classifying transit services and recommend a preferred classification system. This will build on the information collected in the first two tasks and the feedback from the third and fourth task as well as client feedback after review of the first technical memorandum. Possible bases for service classification can include a host of possible differentiating descriptors. In the case of roadway classification in Florida, the factors considered included everything from the extent of intercity traffic to the extent the roadway is used for Hurricane evacuation. Table 1 lists the factors explored in the Florida roadway classification study in the early 1990's.
Table 1 Factors Considered in the Functional Classification of Florida's Roadways

Urban areas:
- Traffic volume
- Length
- Number of lanes
- Speed
- Divided or undivided character

Rural areas:
- Traffic factor
- Length
- Volume of truck traffic
- Network factor
- Access factor
- Number of counties traversed
- System element coefficient

Florida Transportation Commission Criteria:
- Emergency evacuation
- Travel to and through urban areas
- National defense
- Interstate, Inter-regional and Inter-city commerce
- Access to airports, water ports, and major terminals or transfer facilities of other transportation modes
- Public facility access

Source: Functional Classification of Florida’s Roadways July 1991, CUTR

In the case of transit, a number of factors such as trip purpose, trip length, geographic orientation (cross county lines, radial commute) orientation with respect to intercity traffic (feeder to airport, rail/bus station or port), service type (radial, feeder, circulator, express, crosstown), and mode (paratransit, bus, rail, peoplemover). A logical strategy would be to explore how transit service types have a parallel purpose to the roadway system and how that might suggest a functional classification strategy for bus services. Like roadways, a given bus route can serve a number of functions and location types, thus complicating the classification process. Unlike roadways, a bus route can also operate on various types of roadway further complicating classification.

Task 7. Apply the Classification Systems to Miami-Dade - This task will apply the functional classification strategies to the approximately 77 bus routes in Miami noted in Table 2 below. The set or sets of classification criteria (no more than three sets) will be gathered for each route from various sources including available route location and roadway classification information and data provided by Miami-Dade staff. The working relationship CUTR enjoys with Miami-Dade, including onsite office and presence and extensive collaborative studies, will facilitate data gathering. The results
of the classification strategies will be summarized for each functional classification strategy by various measures such as number of routes, route miles, service miles, passengers, etc., as can be developed from the collected data. CUTR currently has the Miami-Dade route network in our GIS data base. The format of data tabulation will be designed to accommodate scenario analyses of various funding strategies as might be carried out in Task 10.

**Task 8. Inventory Existing Transit Service Types** - This task will develop an inventory of existing transit service types for each of Florida’s 25 transit systems. This will include all modes of fixed route services and other services targeted to the general population such as subscription or route deviation services. This task is shifted in sequence from the RFP in order to enable the full application of the functional classification in Miami-Dade to proceed it. After that task the project team will be in a stronger position to assess the types of data and basis for carrying out the inventory. Of key relevance is the linkage between the functional classification system parameters and the inventory parameters that might readily be assembled for the full set of Florida transit routes. Service can readily be inventoried with respect to some basic descriptors for all routes in the state, however, that may not provide all the data necessary to apply the functional classification strategies that are deemed viable at this point in the project. **Thus, this inventory will assemble available data** but full application of functional classification may require additional data assembly or collection as will be done for Miami-Dade.

**Task 9. Prepare Technology Memorandum Two** - This tech memo will document the functional classification of transit services and their application in Miami-Dade County as well as the inventory, Task 8. The draft report will be shared with the steering committee after FDOT review.
### Table 2 - Transit Routes and Share of FDOT Operating Funds for Florida Systems

<table>
<thead>
<tr>
<th>Property</th>
<th># Routes (FY 96)</th>
<th>FY 96 Peak Vehicles</th>
<th>FY 96 Service Area Population</th>
<th>State Operating Funds Received (1997)</th>
<th>Share of Total Operating Funds from FDOT</th>
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<tr>
<td>Miami-Dade Transit Agency</td>
<td>77</td>
<td>599</td>
<td>1,800,000</td>
<td>$12,450,642</td>
<td>6%</td>
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<td>Broward County Mass Transit Division</td>
<td>36</td>
<td>181</td>
<td>1,337,000</td>
<td>$7,294,554</td>
<td>13%</td>
</tr>
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<td>Jacksonville Transportation Authority</td>
<td>58</td>
<td>136</td>
<td>719,720</td>
<td>$3,253,592</td>
<td>13%</td>
</tr>
<tr>
<td>Hillsborough Area Regional Transit</td>
<td>44</td>
<td>159</td>
<td>864,608</td>
<td>$2,717,433</td>
<td>12%</td>
</tr>
<tr>
<td>Pinellas Suncoast Transit Authority</td>
<td>42</td>
<td>105</td>
<td>792,306</td>
<td>$3,834,206</td>
<td>14%</td>
</tr>
<tr>
<td>Lynx Transit (Orlando)</td>
<td>54</td>
<td>152</td>
<td>1,246,310</td>
<td>$3,671,087</td>
<td>9%</td>
</tr>
<tr>
<td>Palm Beach County Transportation Agency</td>
<td>37</td>
<td>122</td>
<td>869,633</td>
<td>$2,986,808</td>
<td>11%</td>
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<tr>
<td>Tallahassee Transit</td>
<td>40</td>
<td>44</td>
<td>138,860</td>
<td>$762,652</td>
<td>9%</td>
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<tr>
<td>Gainesville Regional Transit System</td>
<td>10</td>
<td>33</td>
<td>184,000</td>
<td>$742,569</td>
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<tr>
<td>Volusia County dba VOTRAN</td>
<td>26</td>
<td>42</td>
<td>407,199</td>
<td>$1,666,237</td>
<td>18%</td>
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<tr>
<td>Escambia County Area Transit</td>
<td>19</td>
<td>26</td>
<td>276,559</td>
<td>$1,094,439</td>
<td>27%</td>
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<td>Lee County Transit</td>
<td>15</td>
<td>25</td>
<td>376,702</td>
<td>$1,513,504</td>
<td>31%</td>
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<td>Sarasota County Area Transit</td>
<td>18</td>
<td>25</td>
<td>242,230</td>
<td>$620,732</td>
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<td>Lakeland Area Mass Transit District</td>
<td>12</td>
<td>20</td>
<td>110,000</td>
<td>$650,031</td>
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<td>Manatee County Area Transit</td>
<td>9</td>
<td>9</td>
<td>236,778</td>
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<td>Pasco County Public Transportation</td>
<td>n/a</td>
<td>58 (DR)</td>
<td>305,576</td>
<td>$793,031</td>
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<td>Key West Department of Transportation</td>
<td>2</td>
<td>4</td>
<td>32,471</td>
<td>$142,485</td>
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<td>Space Coast Area Transit</td>
<td>18</td>
<td>14 (MB)</td>
<td>437,740</td>
<td>$1,921,082</td>
<td>50%</td>
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<td>Indian River County Council on Aging, Inc.</td>
<td>9</td>
<td>8 (MB)</td>
<td>102,211</td>
<td>$584,315</td>
<td>46%</td>
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<tr>
<td>Tri-County Commuter Rail Authority</td>
<td>n/a</td>
<td>25</td>
<td>4,000,000</td>
<td>$5,758,845</td>
<td>69%</td>
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<tr>
<td>Okaloosa Coordinated Transportation</td>
<td>n/a</td>
<td>46 (DR)</td>
<td>162,437</td>
<td>na</td>
<td>na</td>
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<tr>
<td>Bay County Council on Aging, Inc.</td>
<td>5</td>
<td>3 (MB)</td>
<td>122,901</td>
<td>$414,338</td>
<td>29%</td>
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<td>St. Lucie County Council on Aging, Inc.</td>
<td>n/a</td>
<td>15 (DR)</td>
<td>166,000</td>
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<td>Winter Haven Urbanized Area</td>
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<td>Ocala/Marion County</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>na</td>
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</tr>
</tbody>
</table>

Source: Columns 1-5 are extracted from technical memos prepared as part of the TDP Manual Update. Columns 6 and 7 are data extracted from the Annual Performance Reporting performed by CUTR for FDOT.

### Task 10. Functional Classification and Funding

- This task will conduct a feasibility
The study of how transit funding can be tied to the functional classification of services. The data bases gained in the first two tasks and the experience from applying this data and the system inventory will enable an informed basis for strategizing on how funding may be tied to functional classification. The data format from Task 7 should enable scenario testing as to how resources might be allocated based on the functional classification measures. This task will also briefly review functional classification as a basis for resource allocation in contrast to other strategies such as those used in current state and federal formula grants as well as performance based scenarios or other strategies identified in the literature. Without prejudicing the proposed exploration of the functional classification, some of the critical issues that are likely to be addressed in this task include:

**The Transit System Impact** - Transportation facilities typically operate as a system, thus, any functional classification will need to fully appreciate the actual traveler behavior and reflect the total contribution of any given service. One might, for example, implement a functional classification system coupled with a funding strategy that favored radial commute trips over “local circulator” services. Thus, downtown circulator service might not score as high. Yet, the downtown circulator system might be the critical element in a system that is designed to bring passengers to a downtown area in one service type and then distribute them by another complementary service type. Similarly, the ability to go to lunch or run errands on a circulator route might be the factor that makes a commuter willing to switch to transit for the work trip commute. A functional classification strategy will need to develop a keen understanding of how the system is functioning in order to fully evaluate the impact of any programs that might shift resource commitments between service types.

**Funding Allocation strategy Impact** - The ability of any type of funding arrangement to meaningfully alter the actual delivered service is influenced if the share of funding from the respective source of reference is a modest share of the total funding subsidy. The modest level of federal funding of operating support, for example, comes with several restrictions, however, the operating agencies are able to use these funds for eligible items such that the impact of restrictions may be very modest. For example, if the State chose to fund with the same total resource commitment only certain service types (functional classes) that constituted about 50% of the total service, the existing levels of state funding could easily be directed toward the eligible 50% of service and the state contribution toward operating expense for these services would go from the current state average of something less than 20% to perhaps 35%, but not necessarily cause any real shifts in service delivery. A funding strategy that favored certain service types would be expected to increase demand to provide that type of service, hence could influence the required resource commitment of the funding agency. If this influence were felt equally across transit properties then there might be a shift of overall service types but not necessarily a shift in
shares of resources between properties.

**Financial Impact Incidence** - The functional classification of roadways carried out in the mid 90’s was initiated as a detailed technical analysis of functional purpose of roadways with elaborate data definition and assembly. The policy considerations, specifically the financial stake of the respective entities resulted in the debate focusing on roadway ownership as that was the consideration most relevant to the actors involved. The passion of various parties when there is a risk of changes in current resource allocation can result in a pronounced interest in the consequences of any given strategy and a desire to influence classification criteria not from a technical perspective but rather to optimize the impact on a given actor. Thus, the need for very careful technical work and data that can withstand scrutiny as well as the partnership buy in opportunity provided by the project panel are very critical.

**Treatment of Other Objectives** - In this era many transit services are intended to accomplish purposes beyond moving people. A common purpose is to shape land use. Other services are intended to provide roadway maintenance of traffic relief, support tourism, provide a travel choice option, insure equity in service allocation and stimulate economic development. Each of these purposes may be accomplished to varying extents by various service types and service to various markets or locations. A funding allocation strategy using functional classification will need to define how important these considerations are from the perspective of the state and then determine which of these goals can be reflected in functional classification data.

**Equity Considerations** - Inherent in any classification scheme is the issue of the equity implications of the strategy. Do small properties tend to be punished because they have shorter more local trips and aren’t taking trips off the interstates? Do social service trips get penalized relative to work trip commutes? These types of questions will be addressed as the various functional classification strategies are considered and explored. Inevitably, the greater degree of control exercised by the State in resource allocation the less freedom the local properties have in programming resources. Caution will be required to insure that the contribution of a functional classification system is sufficiently significant to justify the expense of implementing the system and the disruption to standard practices that might occur.

**Coordination with Other Funding Initiatives** - in addition to the block grant program FDOT has other funding programs including urban corridor and service development initiatives as well as capital project funding criteria. The impact of the functional classification strategy will have to be reviewed in the context of other financial support programs to insure consistency or rationalize differences and address questions that might arise.
Task 11. Technical Memorandum Three - This technical memorandum will report on feasibility and recommendations for a functional classification based transit funding system. The memorandum will be distributed to the steering committee after FDOT review.

Task 12. Final Report - The final report will be compiled from the three technical memorandum that have been produced. Feedback on those memorandum and editing and consolidation as appropriate will result in a final report for the full project.
**DELMERABLES:**

The work scope above will result in three technical memoranda documenting tasks in the work plan. Each will be produced in draft electronic form for FDOT review before printing and dissemination to the committee. A final report will be produced for documentation and dissemination. There will be four meetings of the project panel, an inaugural meeting and three other meetings to discuss the tech memos. For each of these three meetings, each member of the project panel shall receive the tech memos 1-2 weeks in advance of the meeting. CUTR shall make 2 presentations on this project to the Statewide Strategic Plan Advisory Committee. Copies of the Draft Final Report will be provided to the committee for review. Depending on district need, CUTR will work with FDOT to the extent possible, to make presentations regarding the project to District Advisory Committees. Following a comment period a final editing and printing will occur. Forty five (45) copies of each Technical Memorandum are planned and 60 copies of the Final Report will be provided. Presentations to FDOT and the steering committee would be planned for each deliverable. One presentation to Florida Transit Association or another designated groups will be planned.

**PROJECT TEAM**

**Steve Polzin**, **Deputy Director**, will serve as the principal investigator for this project. Dr. Polzin has extensive experience in transit planning and research both in Florida and across the country. He will be involved in the assessment of classification criteria and policy implications of the implementation of such a strategy as well as overall coordination and report writing.

**Ed Mierzejewski, Deputy Director**, will play a significant role in Task two and in overall project review. Dr. Mierzejewski was responsible for the investigation of roadway functional classification carried out by CUTR for the Legislature in the mid 1990’s this comprehensive study explored in detail the classification strategies, implementation issues and public/policy maker reactions to the implementation of such a strategy.

**Joel Volinski, Deputy Director**, will provide review and input and serve on the steering committee. He will review all draft documents and be involved in strategizing on classification criteria and funding strategy linkages. Joel will also coordinate the Miami-Dade application.

**Dennis Hinebaugh, Transit Program Director**, will be involved in evaluation of the
possible classification criteria for use in functional classification of services. He has been involved in public transportation planning in the State of Florida, most recently as the Director of Planning for the Hillsborough Area Regional Transit Authority (HART) in Tampa.

Christopher DeAnnuntis, Research Associate, provides additional depth and substance to CUTR’s research team with expertise in operations and service planning, bus scheduling and runcutting, and transit development planning. Mr. DeAnnuntis has been a transit planner for HART in Tampa and SCAT in Sarasota, as well as a private consultant in the transportation field.

Xuehao Chu, Senior Research Associate, will be involved in the assessment of data availability for classification and analysis of the cost consequences and impacts. Dr. Chu has extensive economic analysis and statistical processing capabilities to bring to the project.

Martin Catala, Research Associate, provides GIS technical analysis support. Martin has worked on numerous transit GIS projects and provides a source of knowledge on Florida transit property route alignments and service characteristics.

**PROJECT SCHEDULE:**

The 12 month project schedule is premised on a notice to proceed on May 1, 1999. (Note: Notice to proceed was in a letter dated June 7, and work was initiated by the end of June)

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<thead>
<tr>
<th>Task/Month</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
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<th>6</th>
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This work order budget is summarized below. The project team will include faculty, students, and secretarial and other support staff who will work directly on the project and whose costs are included in the direct costs of the project. The designated faculty, however, will carry out the vast majority of the research.

CUTR Salaries & Fringe: ......................... $ 90,738.
Expenditures ....................................... $  4,500.
Subcontracts ....................................... $  0
**Total Labor, Subcontract, and Direct Costs** ................ $ 95,238.
Indirect Costs @ 5% ................................ $  4,761.

**Total Task Costs** ............................... $ 100,000.

Invoicing is proposed to occur with the submission of technical memorandum. Progress reporting is proposed to occur quarterly via email.