

GUIDELINES FOR PREPARING THE PROJECT NARRATIVE

The following is a detailed discussion of the key information needed to evaluate proposals against the TIP evaluation and award criteria. While the specific format below is not required, to be competitive a proposal must address all components of the evaluation and award criteria. TIP reviewers are familiar with the technology discussed in the proposal; however, reviewers use only what is provided in the proposal to evaluate the project against the TIP evaluation and award criteria.

A. DEFINITIONS

In preparing a proposal it is important to keep a few key definitions in mind. (A complete list of definitions can be found in 15 C.F.R. §296.2.)

1. Critical National Need is an area that demands government attention because the magnitude of the problem is large and the societal challenges that need to be overcome are not being addressed, but could be addressed through high-risk, high-reward research. Note that each competition will focus on specific societal challenges within one or more areas of critical national need as identified in the *Federal Register* notice announcing the competition.

2. High-Risk, High-Reward Research is research that has the potential for yielding transformational results with far-ranging or wide-ranging implications. The proposed research should address specific societal challenge(s) within one or more areas of critical national need as outlined in the competition solicitation. TIP awards are designed to support, promote, and accelerate innovation within the United States in scientific and technical areas that are too novel or that span too diverse a range of disciplines and would otherwise not find adequate funding from viable alternative sources.

3. Societal Challenges are those problems or issues confronted by society that if not addressed could negatively affect the overall function and quality of life of the Nation, and as such demand governmental attention.

4. Transformational Results are the potential project outcomes that enable disruptive changes over and above current methods and strategies. Transformational results have the potential to radically improve our understanding of systems and technologies, challenging the status quo of research approaches and applications.

B. EXECUTIVE SUMMARY

The proposal should begin with a brief, two-page Executive Summary that acquaints the reviewer with the major ideas in the proposal. It is suggested that the summary be completed after the other sections have been written. The summary should be well thought out and it should carefully map the salient points of the proposal to the TIP evaluation and award criteria. Do not create a summary by simply “cutting and pasting” sections from the body of your proposal; use the summary to present the “storyline” of the proposal against the criteria.

C. PROJECT NARRATIVE

To facilitate the writing of the project narrative and the process TIP uses to evaluate the proposal, it is recommended that the narrative address each of the six sections outlined below. These sections outline the TIP award criteria, and encompass the requirements of the evaluation criteria. Sections 1, 2, and 3 are used as part of the Preliminary Review to determine if the proposal is eligible for further consideration by the Evaluation Panel. Proposals that warrant further consideration will be considered against the evaluation criteria, described in sections 4, 5 and 6, and the award criteria, described in all six sections. Section 4 describes the scientific and

technical merit of the proposal , and 50% of the Evaluation Panel’s consideration of your proposal will be based on the competitiveness of your narrative addressing this Evaluation Criterion. Section 5 addresses how the project will advance the state of the art. Section 6 addresses how the results of the project will enable the anticipated transformational results. The remaining 50% of the Evaluation Panel’s consideration of your proposal will be based on the competitiveness of your narrative addressing the Evaluation Criterion made up of Section 5 and Section 6 combined. The Evaluation Panel’s review is ultimately based on how well the proposal addresses **both** the award and evaluation criteria.

1. Why is TIP Support Necessary?

In the first section of the project narrative, describe why the project needs TIP funding. More specifically, discuss why the project needs taxpayer funds. Because United States tax dollars are used to benefit the Nation, provide evidence to show how the Nation will benefit from the project receiving TIP funding. Relate the specifics of the project to addressing the societal challenge(s) within a critical national need identified in the solicitation but do not merely restate the solicitation. If TIP does not provide funding, will the project be delayed (how long?) or will it be abandoned? Why? What will the potential effect with and without TIP funding be on the potential solution to the societal challenge?

2. Efforts that the Proposer Has Made to Secure Alternative Funding

One of the TIP award criteria requires that the proposer demonstrate what reasonable and thorough attempts have been made to secure alternative funding from other relevant sources before applying for TIP funding. Information about the efforts that have been made and the reasons for being turned down for those funds are important to TIP. TIP’s criteria stipulate that proposers have adequately sought alternative funds but such funds are not available or not available in a reasonable time period.

Each proposer, including each joint venture member if a joint venture, needs to describe the efforts to obtain internal funding (e.g., working capital, retained earnings, or other internal resources), describe the decision-making process and priorities the organization uses for allocating internal funds for research and development. This is especially important if the proposed technology is part of the core technology of the organization. Provide the reason(s) those efforts were not successful.

Efforts made by the proposer, including each joint venture member if a joint venture, to seek funding from external private sources (e.g., angel investors, venture capital firms, industry partners, foundations, etc.) should also be documented and reflect that they have not been successful. Discuss why these efforts were not successful. Be sure to include a discussion of how private investors viewed the technology risk and reward timing associated with the proposal’s approach.

Describe any efforts that the proposer, including each joint venture member if a joint venture, made to seek funding from other government sources (federal, state, and local). Describe any past or current submissions that have been made to other federal agencies and the outcome or current status of those submissions. If there are other sources of government funds that have not been contacted, explain why.

At the end of the proposal include any letters documenting the efforts to secure other funding. If no letter is available, then provide, as an appendix, a table with a brief paragraph for each unavailable letter or additional documentation of the effort, including: the name(s) of the person(s) who formally decided not to fund the project, their title and organizational affiliation, the reason given for the decision, the date the decision was conveyed, and to whom the decision was conveyed. Neither the letters nor the summary table of descriptions documenting specific contacts with potential funding sources count against the proposal page limit.

3. Novelty of the Proposed Research (Technology) With Respect to Competing Developments

TIP-funded research must be novel. It is not the purpose of TIP to foster the development of research results or technologies similar to those other entities have developed, commercialized, marketed, distributed, or sold (i.e., “is it out there in the public domain yet?”). If there are other entities who may appear to have developed, commercialized, marketed, distributed, or sold similar research results (technologies), identify these efforts and explain in science-based detail why the proposed research results (technologies) have the potential to more fully address the societal challenge(s) while the apparently competing technology in development or already existing will not or does not do so to a significantly lesser extent. A direct comparison of key performance metrics associated with the proposed effort to alleged competing efforts to illustrate a “next generation” level of improvement may be critical to making a competitive case.

4. Scientific and Technical Merit and How the Research May Result in Intellectual Property

It is in this section where the proposer(s) must adequately address the scientific and technical merit and how the research may result in intellectual property vesting in a United States entity. The proposer must elaborate on the novelty of the research approach and goals, the high-risk, high-reward nature of the project approach and potential outcomes, the team’s expertise, how the research addresses the technical needs associated with a major societal challenge not currently being addressed, and present the technical plan.

a. Uniqueness of the Proposed Approach and Research Goals

To be competitive, the proposal must convince expert reviewers that the research project is novel. Novel research refers to the technical approach and goals and means the research

effort is new, uncommon, unusual and not currently being addressed. The research approach can be completely novel or a novel integration of existing or new technologies.

However, to be competitive, the proposed research is expected to be transformational, not just an incremental or predictable next step in the evolution of an existing technology (e.g. not a dramatic challenge to the status quo), and not just a combination of existing technologies in a new format. Transformational research enables disruptive changes beyond current methods and strategies, with the potential to radically improve the understanding of systems and technologies.

Therefore, describe how the proposed research is particularly innovative relative to alternative approaches being pursued by domestic and foreign competitors or elsewhere within the proposing team’s organization(s). Describe any known related efforts that may have been unsuccessful, and how your approach avoids or otherwise addresses the pitfalls others may have encountered. Cite relevant patents and the open literature to support this discussion. (To aid the reviewers, include in the discussion a list of the key words for your searches.)

Ignoring state-of-the-art knowledge and ongoing work by others and within the proposing team’s organization(s) may lead reviewers to assume that the proposer is not aware of existing work. Discussing existing efforts helps to ensure that the difference between proposed work and these efforts is clear.

b. Potential to Address Technical Needs Associated with a Major Societal Challenge

Identify the expected outcome(s) of the research. Define measurable success criteria for the proposed research or technology efforts. Provide quantifiable measures. These measures should be explained and contrasted against those for the state-of-the-art and any competing approaches. Explain how the research will specifically address a solution to the societal challenge(s) within an area of critical national need. Each of the major research outcomes should have a measurable, definable end point that correlates

to the solicitation's discussion of a major societal challenge. Proposals that are predominantly basic science that do not have the potential for results that are measurable, definable end points that can address a major societal challenge within an area of critical national need will be considered less competitive.

c. High-Risk, High-Reward Research

Describe the scientific risks or technical barriers that prevent significant advances in addressing the societal challenge(s) within an area of critical national need. The proposal must clearly describe what and where the high technical risk challenges are that must be overcome for the project to succeed. Describing high technical risk also entails articulating how the results have the potential for far- or wide-ranging implications if the risks are overcome, as well as why the proposer believes the research may be too novel or spans too diverse a range of disciplines to fare well in a traditional peer-review process.

Successfully accomplishing the proposed research and surmounting the technical challenges should result in a dramatic transformational change in the future direction and state of the technology. This "path change" should be a major leap forward, advancing the state-of-the-art significantly.

Proposals should provide sufficiently detailed scientific rationale to document the specific high technical risks embodied in the proposed research. The proposal must describe the technical challenges and assess the probability of success of the proposed approach(es).

TIP funds projects that seek to overcome extremely difficult technical challenges. TIP also recognizes that not every aspect of the technical plan will have high technical risk; however, the project must have an overall profile commensurate with high-risk, high-reward research.

Research (technical) risk may be high in the development of one or more single innovations

within the project, or in the integration of disparate technologies, or both. Integration risk can be due to the complexity of the integration effort, unknown properties of the components to be integrated, or other factors. Critical to an explanation of high risk for integration efforts is explaining what new knowledge could result from overcoming the risks and whether the risk is in the integration approach or in the technologies to be integrated. The high cost of integration by itself does not sufficiently justify a claim of high technical risk.

The proposal should also describe the technical and scientific benefits (leverage or high-return) that will be derived from the research proposed. It is often helpful to discuss this from the perspective of a fully successful as compared to a partially successful effort.

Summarize the impact, or technical leverage, of successfully accomplishing the proposed research and overcoming the high technical risks. Technical leverage is the possibility of using the research results or approach beyond the initial applications.

d. Qualifications of Proposed Research Team

In this section, the information required about the key technical team members that will work on your project will be described. Most projects require a multidisciplinary approach to overcome technical barriers. Describe the quality and appropriateness of the technical staff assigned to the project, and the amount of time each individual will allocate to the project. Briefly highlight the educational background and experience of key personnel, including contractors. TIP may request two-page resumes for each key team member during the review by the Evaluation Panel. If key staff will be hired, describe the qualifications needed for key positions not yet filled and the timeline for hiring these staff.

e. Research Plan Is Scientifically Sound With Tasks, Milestones, Timeline, Decision Points and Alternative Strategies

The technical plan must explain how the research and technical objectives will be reached. It must address the “what, how, where, when, why, and by whom” in substantial detail. It must anticipate likely scientific or technical problems and describe how these problems will be overcome. The technical plan should therefore detail each key research activity and provide the basis for project management oversight of that activity should TIP issue an award. A detailed technical plan is critical for effective project management, for development of a reasonable budget, and for good communications between the TIP Project Manager and the Principal Investigator. Therefore, a sound, detailed technical plan is necessary for a proposal to be competitive.

(1) Technical Approach - The elements of the technical plan must fit together in a reasonable and logical way to instill confidence that the team can implement and conduct the proposed approach.

The following sub-elements in the technical plan are required:

(a) Tasks and Subtasks - Discuss how the work will be organized into tasks and subtasks. Provide clear descriptions for tasks and subtasks performed by operational units within the proposing organization as well as by any contractors. Clearly identify these contractors if known at the time of proposal submission. If the contractor is not known, provide the qualifications needed to perform the proposed contract work. Explain the technical rationale for the major tasks. Indicate the level of risk of each task (e.g., high, medium, low). Clearly link tasks in the budget to the proposer, including each joint venture member if a joint venture, and to contractors (where appropriate). Highlight major risks and innovations inherent in specific tasks and the strategies for managing unexpected results. High-risk research often needs contingency plans, alternative or parallel technical approaches for carrying out key portions of the technical work: discussing these alternatives is also part of a good technical plan. Highlight the level of risk and innovation

inherent in each of these approaches in the proposal and compare them to the primary approach. Proposals that contain alternative or parallel efforts that significantly impact the overall proposal’s profile of research risk, or novelty of the research innovation may be considered less competitive.

(b) Interrelationship of Tasks - Discuss how the tasks link to one another, which tasks depend on others, which tasks are sequential, and which tasks will be done in parallel. If contingency plans are used in the event the primary approach is unsuccessful, describe how these tasks will be incorporated, and under what conditions.

(c) Metrics - Provide clear and concrete quantifiable metrics for measuring the project’s progress toward the overall technical goals. Define what technical success would look like, i.e., these metrics should relate to the project’s technical objectives, targets, and success criteria. Quantify the extent to which this advances the current state of the technology. Metrics used at decision points to decide on proposed next steps are critical. See Table 1.

(d) Milestones - Provide appropriate interim and final key milestones for each year of the technical plan (by project years, not calendar years) and tie these to the metrics. Identify the organization responsible for, or with a key contribution to, each milestone. Milestones are critical for tracking progress made in the project. Include a discussion of the strategy for validating that a critical milestone’s metrics have been met. See Table 1 for an example.

(e) Decision-Point Strategy - Provide go/no-go and other decision points for the project as appropriate. High-risk research can fail. Well-defined decision points provide a roadmap in terms of milestones and metrics showing a validated, quantifiable way that a project or line of research has succeeded or failed. For example, if a new material passes a stress test at a milestone, the decision is clearly to continue. If it fails the stress test at that milestone by a significant amount, then the project plan may recommend a designated alternative approach. If the designated alternative fails, then the project

plan may define this as a no-go decision point that terminates the project. Projects that pursue more than one technical approach in parallel must discuss how the decision to select among those approaches will be made and when it will be made in the decision-point strategy. A good decision-point strategy identifies early go/no-go decision points within the first 12-18 months of a project. Appropriateness of the high-risk elements of the project should fall within this

time frame. Risks, milestones, metrics, and decision points must be linked in the decision-point strategy. A decision-point tree or critical-path chart may be very helpful to communicate this information. One example of a decision-point strategy is given in the Figure below, but there are many other ways to effectively portray the information.

Table 1: Milestones/Metrics

Milestone	Timing	Responsible Organization	Metric	Minimum Value for Successful Result	Test Method	Decision
Material Down selection	First year, quarter 3	Company ABC	Figure of merit for performance (range of values)	Exceeds current technology by 200%	Series of evaluation methods	Choose optimal performance or restructure
Matrix to support cell attachment, spreading and cell in growth timing (for Engineered Rotator Cuff)	Month 15	Contractor	Timing for cell attachment and spreading throughout the matrix (range of values)	Uniform cell attachment within 5 minutes of seeding and spreading within 30 minutes at all levels of modular matrix	Use of RGD covalent coupling to enhance rates of cell attachment and support spreading	If coupling is not even throughout matrix, move from static to perfusion coupling to ensure reagent matrix contact
Demonstrate functionality of candidate sensor tips	First year, quarter 2	Contractor 1	Figure of merit based on performance standards (range of values)	Sensitivity, spatial resolution, and power consumption within 70% of final targets	Verified test methods	Select superior candidate tip or re-evaluate technical approach
Integrate and demonstrate catalyst synthesis, probe reaction, miniaturized analytical methods, and informatics system	End Year 3	Company 1 (JV Lead) and Company 2	Generate 2 new candidate lead compounds for lab-scale tests using process-grade raw material feed stocks	Candidate compounds must show: a) 15% improvement in reaction yield at reduced reaction temperatures and b) 50% higher selectivity in probe reactions	High throughput synthesis and analysis techniques	Explore different region of chemical composition space if lead compounds don't meet minimum requirements for success

Figure: Decision-Point Strategy (Example)



(f) Gantt Chart - Include a Gantt chart or other project timeline chart that illustrates timing of major tasks and key subtasks. These charts should include the level of risk associated with each task, the responsible individual(s) and organization(s), milestones, and decision points, as appropriate and should be consistent with your project and budget narratives. The timeline

chart acts as a critical “task map” of your technical plan for reviewers and for the overall project if it is selected for funding. In addition to the timeline chart, the project tasks must be described in narrative form. It must be clear how the goals of the project will be achieved by those tasks. See Table 2 for an example.

Table 2: Gantt Chart (Example)

Tasks	Q 1	Q 2	Q 3	Q 4	Q 5	Q 6	Q 7	Q 8	Q 9	Q 10	Q 11	Q 12	Performers	Level of Risk	Major Milestones, Metrics, and Decision Points
1.0 Task	-- -	---	--	--	--								Smith	High	
1.1 Subtask	-- -	M1											Contractor A	High	M1: Measure X must be greater than Y
1.2 Subtask		---	M2										Jones	Medium	M2: Material property P must be at least Z
1.3 Subtask		---	---	M3									Ahmed	High	M3: Test specific feature using described test plan Decision: If the test fails then use designated alternative
1.4 Subtask			--	--	M4								Wang	High	M4: Performance metric must exceed threshold Decision: If performance metric is not achieved, then terminate project
2.0 Task				----	----	-- --	----						Wilson	Low	
2.1 Subtask				----	M5								Todd	Low	M5: Component must be assembled
2.2 Subtask				----	M6								Jones	Low	M6: Component must be assembled
2.3 Subtask						-- --	M7						Taylor	Low	M7: Complete initial prototype
3.0 Task							----	-- --	-- --	M8	- -	- -	Wang	Medium	M8: Test system on specified dataset
3.1 Subtask										---	---	M9-	Ahmed	Medium	M9: Complete final test scenario

(2) Adequacy of Facilities, Equipment, and Resources - Briefly discuss the research facilities and specialized equipment required for this proposed project. Identify what facilities, equipment, and resources already exist for use; what will be obtained through contracting; and what must be obtained even though sources are not yet identified. Provide the timeline for obtaining needed facilities, equipment, and resources. Major equipment purchases need to be clearly linked to the appropriate research tasks and be described in the project budget narrative. Any collaboration agreements for access to facilities and/or associated staff being claimed as critical to tasks in the proposal must be clearly described. Copies of these agreements may be requested during the review by the Evaluation Panel (e.g., using a federal laboratory facility to perform research tasks in the proposal under a user agreement, CRADA or other written agreement). Descriptions of verbal agreements between parties for facilities access are not likely to be considered as competitive as those with written agreements, and may not be compliant with the requirements of the Program.

(3) Contractors - Projects may include contractors to obtain key expertise, access to existing facilities, or specialized goods and services. Discuss what each contractor brings to the project. Clearly identify what each contractor will do and why that contractor was chosen. Please note that contract awards must be in accordance with the Procurement Standards found in 15 C.F.R. Part 14. Discuss the relationship of the work to be done by the contractor to the technical plan. Discuss how contractor progress will be monitored and redirected as appropriate. Contractors may not contribute to the cost-sharing requirement. *Note: If a proposed recipient prefers to meet its cost share by entering into subawards with subrecipients, this can be considered on a case-by-case basis upon receipt and acceptance of subaward agreements prior to award.*

TIP expects that the proposer or the JV members if a joint venture will direct and carry out most of the key high-risk and high-innovation tasks. For example, a single company structured as a “virtual company” that proposes to have

contractors perform most of the high-risk tasks is not expected to be competitive, or may not be eligible for an award.

In system or device integration projects, the proposal should make clear how the proposer is involved in integrating the technologies and taking the system forward if contractors are key players in the actual integration tasks.

Projects with high levels of contracting need to specifically address how this structure is effective in terms of cost, organizational efficiency, and long-term impact of the research results.

(4) Justification for R&D Activities At Non-U.S. Sites - TIP strongly discourages use of non-U.S. sites for research and development activities. In the event that the project includes work performed at a non-U.S. site, a completed Form NIST-1022H, R&D Work Performed outside the United States by the Recipient or Contractor Questionnaire (see Exhibit 11) must be provided. If a portion of the project can only be carried out at a non-U.S. site because of the site’s unique capabilities, the answers to the questions in Form NIST-1022H should explain the technical work to be done, the relationship of this work to the overall project, the cost of this work, the unique capabilities associated with the non-U.S. site, and why equivalent work cannot be performed within the United States.

5. What is the Potential for Advancing the State of the Art?

This section must explain how the research can advance the state-of-the-art and contribute to the U.S. science and technology knowledge base. Explaining how the proposal advances the state-of-the-art should start with a clear definition of the current state-of-the-art to establish the difference the project will make. Explain the difference that complete success, partial success and failure to achieve any goals will make to the state-of-the-art. Regardless of the project outcome, what difference will knowledge of the results of this project make to the broader research community with special emphasis on

the research community in this area of critical national need? Knowledge of failure can benefit other researchers considering a variety of possible directions.

Explain how the research results will contribute to the U.S. science and technology knowledge base. Describe the preferred strategy for disseminating the research results, and the level of commitment to that strategy for each proposed research participant. The strategy may combine diverse elements such as publishing some portions of research results, patenting, licensing of patents or of the technology itself, partnerships with manufacturers or with the next level of the solution process, holding seminars, or, for universities, teaching students or authoring textbooks. Be sure to consider how the dissemination strategy will reach across all the disciplines that could benefit from the research results with special emphasis on those most directly addressing the critical national need. The strategy must demonstrate how the state-of-the-art can change as a result of the project. Implementing the knowledge dissemination strategy could involve others beyond the proposing team. Include a detailed discussion as to the capabilities of all parties to implement the proposed technology. This discussion of capabilities for implementation is not the same as the discussion of the proposer's own capabilities to carry out the technical plans as proposed for the award.

Successfully accomplishing the proposed research and surmounting the technical challenges should result in a dramatic transformational change in the future direction and state of the technology. This "path change" should be a major leap forward, advancing the state-of-the-art significantly.

6. Transforming the Nation's Capacity to Deal with Major Societal Challenges

In this section, describe how the research (technology) has strong potential to address societal challenge(s) in an area of critical national need and how the benefits extend

significantly beyond the direct return to the participants in the research.

Describe how research results and contributions to the U.S. technology knowledge base will diffuse beyond the proposed participating organizations while those organizations maintain ownership of core knowledge needed to most effectively implement the project's technical results. Discuss the planned use of patents, copyrights, trade secrets, and any other forms of intellectual property protection. Discuss any planned strategy for publishing, presenting or disseminating the technical results, including enabling methodologies that may not be patented.

The proposal must include a plan that explains how and when results of the proposed technology will have positive effects on the project participants and the Nation as a whole.

Competitive proposals should clearly define the societal challenge that the proposed technology is trying to solve in sufficient detail to enable a clear link to be made between the problem to be solved, the proposed solution, the dissemination of the solution, and the potential for overall impact on the Nation.

a. Potential magnitude of the transformational results

Describe how the Nation's capabilities to address a societal challenge(s) in an area of critical national need will be different once the results of this research are put to use. Be clear about the current baseline in the nation's capabilities. Be sure to make clear how the results could extend beyond the initial societal challenge target areas.

Provide a description of the magnitude of the impact or difference that the technology will make. For example, benefits in healthcare could be reducing the number of accidental deaths due to errors in surgical procedures; benefits from developing new sources of sustainable energy could reduce the Nation's dependency on foreign sources; and the like. Describe any

assumptions and document and quantify wherever possible.

Be clear in the discussion about the difference, or “added value,” that TIP funding makes in realizing the societal benefits of the proposed project. In general, the competitiveness of a proposal is strengthened through a clear description of the specific change expected and the potential impact in solving societal needs. In discussing the advantages of this proposed technology, be sure to document what, if any, alternate technologies have been developed or are being developed. If an alternate technology has already been developed, discuss the reason why it has not been helpful in solving the societal challenge(s) being discussed.

b. How and when will the ensuing transformational results unfold?

Explain how the research results will be put to use addressing the societal challenge(s).

Discuss who will be the potential users of the research results (technology) in the immediate future and the more distant future and the relationship to solving the stated societal need(s). Simply put, how will the research results (technology) be used? How will the research results (technology) move from the research team to those who will use it to address the societal challenge?

Describe how the research (technology) will be implemented to have the best opportunity to solve the stated areas of critical national need and societal challenges. There will be no impact to the common national good if the research (technology) cannot or will not be implemented. Identify barriers that could hinder the full implementation of the proposed research (technology) if it is successful and describe how and when these barriers will be overcome.

If this research will result in technology that is part of a larger system, describe any other technical breakthroughs that are needed to make this research useful to the nation. How and when will the research and development needed for

this technology take place? Who is likely to provide the technology? What is the basis for the assertions about the availability of this related technology?

Describe the timeline for implementing the research results.

c. Capacity and commitment of each participant

This section of your project narrative should address the following:

(1) Organizational Commitment – For each participant, describe the organization’s effective commitment to performing the research proposed. This commitment includes the resources to be brought to the TIP project. Describe the commitment in terms of the financial resources, time commitment of key people in the organization, equipment, and dedicated facilities. Describe the relationship of this project to the organization’s strategic vision and direction. Provide evidence of commitment from senior management to the project. TIP requires a letter of commitment signed by an authorized senior executive of the single company and from each joint venture member. These letters must verify the availability of all cost share funds. If there are commitments from regional, state, or local agencies or private sources of capital to contribute cost-sharing funds, indicate the nature of those arrangements and give evidence of the commitment. NOTE: Contractors may not provide cost share.

(2) Organizational Information - TIP needs to know about the current status of the companies involved in a project it might fund. Provide information about the date and state of incorporation, how the proposing organization(s) is organized, overview of financial information, past experience, and related government work.

(3) Current and Past Federal Awards - Provide a list of all current and past federal R&D contracts, grants, and other awards for the previous five years and all pending federal awards in the general area of this proposal. For example, provide a list of the Small Business

Innovative Research (SBIR) grants received for the previous five years. Include the name of the project, the funding agency/organization, the grant/contract/award number, the principal investigator, and the federal government contact's name and phone number. For current or past awards having some relationship to the technology being proposed to TIP, briefly describe how the proposed project is distinctly different and not a duplicative effort. See Table 3 for the required format.

(4) Financial, Employment, and Ownership Information - Provide information about the financial status, current employees, and ownership of the proposing single company or for each member of a proposed joint venture (except universities, national laboratories and

government agencies). See Table 4 for the required format. These worksheets must be provided as an appendix to the proposal. The worksheet is not included in the page limit; however, this worksheet is to be included in the appendix. If financial statements or annual reports are included as an appendix, they will be discarded before the proposal review process begins. If the proposal is recommended for funding, then the proposing single company or each joint venture member (except universities, national laboratories and government agencies) will be asked to provide the following:

1. Privately held companies and non-profit organizations: most recent financial statements;
2. Publicly traded companies: most recent 10-K SEC filing or annual report.

Table 3: Federal Awards Received By Company/Organization or Principal Investigator for All Technologies for Previous Five (5) Years (Example)

Project Title	Award No.	Total Federal Award (\$)	Performance Period (M/Y to M/Y)	Name of Principal Investigator, Address, & Phone No.	Name of Federal Agency, Federal Program Manager, Address, & Phone No.
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Table 4: Financial, Employment and Ownership Information for Previous Three (3) Years

Financial Information	Current Year to Date	Last Year	Two Years Ago
Income			
Contract R&D			
Product Sales			
Other			
Total Income			
Expenditures			
Cost of Goods Sold			
R&D			
General and Administrative			
Total Expenditures			
Gross Income Before Taxes			
Net Income After Taxes			
Balance Sheet	Current Year to Date	Last Year	Two Years Ago
Assets			
Current Assets			
Fixed Assets			
Total Assets			
Liabilities			
Current Liabilities			
Long-term Liabilities			
Stockholders Equity			
Total Liabilities and Equity			
Employment Information	<i>Number of Employees</i>		
	Current Year to Date	Last Year	Two Years Ago
Full Time			
Part Time			
Full Time R&D			
Part Time R&D			
Ownership Structure (for private companies)	Current Percentage	For private companies less than 3 years old	Current Capitalization
Founders		Venture Capital	\$
Directors		Angel Investors	\$
Employees		Individuals	\$
Investors		Self-funded (Officers / Directors)	\$
Individuals		Other (e.g., state)	\$
Other (e.g. ESOP)		Total	\$

D. REQUIRED LETTERS (letters are not included in the page limit)

TIP reviewers scrutinize the content of letters very carefully to understand the actual commitment of the signatory. Table 5 summarizes which letters are required under what conditions. The remainder of this section discusses what is required in each type of letter.

1. Letters of Commitment

Letters of commitment commit specific resources to the project if the project is funded.

a. Single Company Proposer - A letter of commitment from an authorized senior executive of the company is required to indicate the importance of the project to the company and the company's commitment to supply key resources (e.g., the time of key personnel, cost sharing, equipment, and facilities).

b. Joint Venture Proposer - Letters of commitment from an authorized senior executive of each organization in the joint venture is required to indicate the importance of the project to the organization and the organization's commitment to supply key resources (e.g., the time of key personnel, cost sharing, equipment, and facilities).

c. Contractors - Letters of commitment from contractors who are key to the technical plan's success are useful for verifying the availability of resources, but are not required.

d. Prospective Employees - Letters of commitment to join the proposing organization's team are useful for verifying the availability of key personnel who are not yet employed at a proposing organization, including joint venture

member, to participate in the project if the project is funded. These letters are not required but they can play an important role in conveying the appropriateness of key staff members, especially for projects involving small companies or startups.

e. Letter of Commitment for Third Party (External) In-Kind-Contributions - A letter of commitment from an authorized senior executive of any organization providing third party in-kind contributions that are to be used as cost share is required. This letter should clearly state the form(s) of the third party in-kind contribution, value of the in-kind contribution, and the time period over which the third party in-kind contribution is made. In addition, the Form NIST-1022D, Third Party In-Kind Contribution (see Exhibit 7) must be completed.

f. Letter of Commitment for Third Party (External) Cash Contributions - A letter of commitment from an authorized senior executive of any third-party (external) organization providing cash contributions that are to be used as cost share is required. This letter should clearly state the amount of the cash contribution, the time period over which the third party cash contribution is made, and interim performance requirements for phased contributions, if any.

2. Letters of Support

Letters of support indicate a willingness from potential members to become involved later in the project if it is funded.

a. Contingent Funding - Sometimes a potential investor will indicate a strong interest in evaluating the results of a project for possible future uses. This type of letter can help verify that the pathway to further uses of the research in the proposal has been studied and is feasible. *If this funding is critical to the financial viability of the organization in the first year of the project, a letter is required.*

b. Strategic Partner - Strategic partners can aid the future potential for the research to yield transformational results and in the diffusion of

the technology beyond the proposer. Letters of support from strategic partners that demonstrate that the research has the potential to yield transformational results and likely benefit the Nation are helpful in the proposal evaluation process. If letters are not available, but there has been some contact with a potential strategic partner, the proposer may document the contact in a paragraph, providing name, title, organizational affiliation of the contact, date of the contact, and extent of the contact. This paragraph can be included as an appendix, outside the page limit.

3. Letters of Corroboration, Documenting Efforts to Secure Other Funding

Letters documenting the proposer's search for capital prior to seeking funds from TIP are

required for documenting the proposer's need for TIP funding. This especially includes letters from potential funding sources indicating why they chose not to fund the project. If a letter from a potential funding source that chose not to fund the project is not available, the proposer must document the interaction with the funding source as discussed in Section C.2 of this chapter entitled, Efforts that the Proposer Has Made to Secure Alternative Funding. This alternate information should include the name of the person who decided not to fund the project, their title, organizational affiliation, the reason given for the decision, the date the decision was conveyed, and to whom it was conveyed. This should be done for each funding source that was approached and declined to fund the project and put into a table format. This table is not included in the page limit.

Table 5: Summary of Types of Letters – Required or As Appropriate

Type of Letter	Required	As Appropriate
1. Letters of Commitment		
a. Single Company Proposer	Required – signed by authorized company official to document source of cost share	
b. Joint Venture Proposer	Required from each joint venture member – signed by authorized organization official to document source of cost share	
c. Contractors		Optional – useful if contractor is critical to project
d. Prospective Employees		Optional – useful if key personnel are not yet organization employees
e. Third Party In-Kind Contributors	Required – signed by authorized organization official to commit third party in-kind contributions	
f. Third Party Cash Contributors	Required – signed by authorized organization official to commit third party cash contributions.	
2. Letters of Support		
a. Contingent Funding	Required only when funding is critical in the first year of the project	
b. Strategic Partners		Optional – Letters from or descriptions of contact with potential strategic partners
3. Letters of Corroboration		
Letters of corroboration, documenting efforts to secure other funding	Required - Letters from or descriptions documenting contact with funding sources and the outcome	

PROPOSAL SUBMISSION REQUIREMENTS CHECKLIST

NOTE: Proposals that deviate substantially from these guidelines or that omit required information may be found unresponsive and may not be considered for funding.

A. PROPOSAL FORMAT

- 1. **Bindings.** If submitting by paper rather than electronically, bind all copies (including signed original) of the proposal, except one copy, securely. Bindings that permit the proposal to lie flat while being read are preferred. Loose-leaf ring binders or stapled copies are not acceptable.
- 2. **Double-sided copy.** Print on both sides of the paper (front to back counts as two pages).
- 3. **E-mail proposal submissions.** Will not be accepted.
- 4. **Facsimile (fax) proposal submissions.** Will not be accepted.
- 5. **Figures, graphs, and images.** Should be of a size that is easily readable or viewable.
- 6. **Font.** Times New Roman, Arial, or equivalent and readable (12-point minimum).
- 7. **Line spacing.** Single.
- 8. **Margins.** One (1) inch top, bottom, left, and right.
- 9. **Number of copies if submitting by paper rather than electronically.** Sixteen (16) (1 original, signed, bound proposal plus 15 copies [1 unbound and 14 bound]). If the original proposal is in color, all copies must also be in color. If the proposal is submitted electronically, paper copies are not required.
- 10. **Page limit.** 30 pages for single company; 40 pages for joint venture.

Page limits exclude: SF-424 (R&R), Application for Federal Assistance; Research and Related Other Project Information; Form NIST-1022; Forms NIST-1022A through NIST-1022H; Executive Summary; list of bibliographic technical references; Table of Abbreviations; Financial, Employment, and Ownership Information for the Previous Three (3) Years; letters of commitment; letters of support; letters of corroboration; and any human and/or animal subjects documentation.

Page limits include: All text, schematics, diagrams, flowcharts, tables (except Financial, Employment, and Ownership Information for the Previous Three (3) Years), pictures, images, illustrations, and resumes. To maximize pages for relevant technical information, the following suggestions are offered:

- (1) List data only for the key people and briefly highlight their education and experience. Do not include lengthy resumes for all people involved in the project.
- (2) Do not include copies of published papers as appendices.

- (3) Do not include supplemental material not specifically requested in this Proposal Preparation Kit, either separately or bound with the proposal.
- (4) Do not include company sales catalogs, financial statements (TIP may request these during the Evaluation Panel's consideration on the proposal), videotapes or audiotapes, presentation slides, and other marketing materials.

- 11. Page numbering.** Number pages sequentially.
- 12. Paper size.** 21.6 by 27.9 centimeters (8 1/2 by 11 inches).
- 13. Proposal language.** English.
- 14. Table of contents.** Not required.
- 15. Typed document.** All proposals, including forms, must be typed; handwritten proposals and forms will not be accepted.

B. PROPOSAL FORMS AND OTHER REQUIREMENTS

(Forms are included in this Proposal Preparation Kit as exhibits and are posted on the TIP website at <http://www.nist.gov/tip/helpful.html>.)

1. SINGLE COMPANY ONLY (also complete items in section B.3. below)

- a. Proposal is from a small- or medium-sized eligible company.
- b. Total project duration does not exceed 3 years.
- c. Total TIP funding requested does not exceed \$3 million.
- d. Proposal includes Form NIST-1022E, Estimated Multi-Year Budget – Single Company (see Exhibit 8).

2. JOINT VENTURE ONLY (also complete items in section B.3. below)

- a. At least two separately owned, small- and/or medium-sized eligible companies OR at least one small- or medium-sized eligible company and one institution of higher education are part of the joint venture and are substantially involved in the R&D and both are contributing to the cost share.
- b. Lead member of the joint venture submitting the proposal is the small- or medium-sized company or institution of higher education.
- c. Total project duration does not exceed 5 years.
- d. Total TIP funding requested does not exceed \$9 million.
- d. TIP funds are not requested for any large-sized company joint venture member.

- e. Proposal includes Form NIST-1022A, Other Joint Venture Members (see Exhibit 4).
- f. Proposal includes Form NIST-1022F, Estimated Multi-Year Budget – Joint Venture (see Exhibit 9)

3. BOTH SINGLE COMPANY AND JOINT VENTURE

- a. TIP funds are not requested for indirect costs.
- b. Cost sharing is at least 50 percent of total yearly project costs (direct plus all of the indirect costs).
- c. Proposal includes SF-424 (R&R) (2 pages), Application for Federal Assistance (see Exhibit 1). Note that there are multiple versions of the SF-424, therefore, be sure to use the SF-424 (R&R) version.
- d. Proposal includes Research and Related Other Project Information (see Exhibit 2).
- e. Proposal includes Form NIST-1022, Technology Innovation Program Proposal Information Sheet (see Exhibit 3).
- f. Proposal includes Form NIST-1022B, Contractors (see Exhibit 5), if contractors are proposed in budget.
- g. Proposal includes Form NIST-1022C, Budget Narrative (see Exhibit 6).
- h. Proposal includes Form NIST-1022D, Third-Party In-Kind Contributions (see Exhibit 7), if applicable.
- i. Proposal includes Form NIST-1022G, Foreign-Owned Company Questionnaire (see Exhibit 10), if applicable. If there is more than one such company, separate questionnaires must be submitted for each one.
- j. Proposal includes Form NIST-1022H, R&D Work Performed Outside the United States by the Recipient or Contractor Questionnaire (see Exhibit 11), if applicable. If there is more than one such instance, separate questionnaires must be submitted for each instance.
- k. Proposal includes Executive Summary (two page limit) (see Chapter 2).
- l. Proposal includes Project Narrative (see Chapter 2).
- m. Proposal includes list of bibliographic references supporting assertions and data including patent citations (see Chapter 2, Section F).
- n. Proposal includes Table of Abbreviations that define abbreviations likely to be unfamiliar to the reader. Common abbreviations, for example, U.S., TIP, DoD, and cm, need not be defined.
- o. Proposal includes Financial, Employment, and Ownership Information for the Previous Three (3) Years (see Chapter 2, Section C).
- p. Proposal includes letters of commitment, as required (see Chapter 2, Section D).

- q. Proposal includes letters of support, as appropriate (see Chapter 2, Section D).
- r. Proposal includes letters of corroboration, documenting efforts to secure other funding, as required (see Chapter 2, Section D).
- s. Proposal includes information regarding human subjects and/or live vertebrate animals in research activities, if applicable. (See Chapter 4, Human Subjects Determination Checklist, to assist in determining whether the proposal may have human subjects involvement, which would require additional information within the proposal submission. If the required information is not included with the proposal, the proposal may be deemed unacceptable. Refer to the booklet titled *TIP Guidelines and Documentation Requirements for Research Involving Human and Animal Subjects*, which can be obtained at <http://www.nist.gov/tip/helpful.html> or by calling 1-888-847-6478. Timelines for submission of required human subjects and live vertebrate animal documentation are included in the booklet as Appendices 5 and 6.)
- t. Amounts on the Forms NIST-1022E (Estimated Multi-Year Budget – Single Company) and NIST-1022F (Estimated Multi-Year Budget – Joint Venture) add correctly and correspond with amounts on the Form NIST-1022C (Budget Narrative).
- u. Amounts on Forms NIST-1022E (Estimated Multi-Year Budget – Single Company) and NIST-1022F (Estimated Multi-Year Budget – Joint Venture) correspond with amounts on the Form NIST-1022B (Contractors), if contractors are proposed.
- v. Proposal does not include ineligible projects and/or ineligible/unallowable costs as identified in Chapter 1, Section D.

C. PROPOSAL ASSEMBLY/PRESENTATION ORDER

- a. SF-424 (R&R), Application for Federal Assistance (see Exhibit 1).
- b. Research and Related Other Project Information (see Exhibit 2).
- c. Form NIST-1022, Technology Innovation Program (TIP) Proposal Information Sheet (see Exhibit 3).
- d. Form NIST-1022A, Other Joint Venture Members (see Exhibit 4), if a joint venture.
- e. Form NIST-1022B, Contractors (see Exhibit 5), if contractors are proposed.
- f. Form NIST-1022C, Budget Narrative (see Exhibit 6).
- g. Form NIST-1022D, Third-Party In-Kind Contributions (see Exhibit 7), if applicable.
- h. Form NIST-1022E, Estimated Multi-Year Budget – Single Company (see Exhibit 8) or Form NIST-1022F, Estimated Multi-Year Budget – Joint Venture (see Exhibit 9).
- i. Form NIST-1022G, Foreign-Owned Company Questionnaire (see Exhibit 10), if applicable.
- j. Form NIST-1022H, R&D Work Performed Outside the United States by the Recipient or Contractor Questionnaire (see Exhibit 11), if applicable.
- k. Executive Summary (two (2) page limit) (see Chapter 2).
- l. Project Narrative (see Chapter 2).
- m. List of bibliographic technical references supporting technical assertions and data including patent citations (see Chapter 2, Section F).
- n. Table of Abbreviations.
- o. Federal Awards Received By Company/Organization or Principal Investigator for All Technologies for Previous Five (5) Years

- p. Financial, Employment, and Ownership Information for the Previous Three (3) Years (Chapter 2, Section C).
- q. Letters of commitment, as required (see Chapter 2, Section D).
- r. Letters of support, as appropriate (see Chapter 2, Section D).
- s. Letters of corroboration, documenting efforts to secure other funding, as required (see Chapter 2, Section D).
- t. Additional information regarding human subjects and/or live vertebrate animals in research activities, if applicable.

D. ADDITIONAL DOCUMENTATION

The following additional forms and documents, which are available at <http://www.nist.gov/tip/helpful.html>, may be requested from a proposer at any time during the multi-disciplinary peer-review process:

1. SF-424B, Assurances—Non-Construction Programs.
2. Form CD-346, Applicant for Funding Assistance.
3. Form CD-511, Certifications Regarding Lobbying.
4. SF-LLL, Disclosure of Lobbying Activities, if applicable.
5. Financial information (see Chapter 2, Section H).
6. Additional human and/or animal subjects documentation, if applicable.
7. For joint ventures only, a credible draft Joint Venture Agreement (JVA) that must be initialed by each joint venture member acknowledging review and preliminary concurrence. The information below is provided in advance to alert joint venture members of the minimum requirements so that the parties may begin negotiating the JVA early:
 - a. Authorization for one of the joint venture members (a legal entity, not an individual person) to serve as the Joint Venture Administrator to bind all of the other members to the terms and conditions of the NIST/TIP award and to administer the NIST/TIP award on behalf of all of the members.
 - b. Treatment of intellectual property—that is, who will own what, including provisions granting the required licenses to the government and acknowledging the TIP statutory intellectual property rights ownership requirement.
 - c. Agreement that the TIP award terms and conditions take priority over those in the JVA.
 - d. Acknowledgment by the parties of their respective cost-sharing commitment and that no party is responsible for the cost-sharing commitment of any other party.
 - e. Acknowledgment that if a party is removed unilaterally by the NIST Grants Officer, that party is also removed from the Joint Venture Agreement.
 - f. Provision for a party's withdrawal from the JVA, including immediate notification to the NIST Grants Officer.
 - g. Inclusion within any dispute resolution provision, the parties' acknowledgment that NIST may, at any time, suspend or terminate the NIST Cooperative Agreement.

Although the draft JVA only requires initials by each joint venture participant at the time of submission, it must be finalized, signed by all joint venture members, and approved by NIST before an award can be made. Failure to provide an acceptable, executed JVA by the established due date will jeopardize issuance of an award. An award will not be deferred in order to give more time to finalize a JVA. A sample JVA and Intellectual Property Plan is available on the TIP website (<http://www.nist.gov/tip/helpful.html>). The sample JVA includes important information; however, it is not meant to be the sole JVA model. If a joint venture wants to develop its own JVA, it may do so,

provided the minimum provisions mentioned above are included, and provided that the alternative JVA does not otherwise conflict with TIP requirements. A draft JVA that has not been completed to include the required information will not be accepted. The legal name and contact information of each JV participant must be provided; include only those organizations to be bound by the JVA.

Some issues that are most often raised by organizations' legal counsel in negotiating the JVA include the following:

- a. Who will hold title to intellectual property?
- b. How are revenue streams to be divided?
- c. What indemnification provisions will be acceptable to all parties?
- d. Who will be the spokesperson for the joint venture?
- e. Who authorizes licensing agreements?
- f. Who handles the billing to NIST and brings issues to NIST's attention?
- g. What will happen during the course of the project if one party drops out and/or another party wishes to join?
- h. Who will coordinate writing the quarterly reports to be submitted to NIST/TIP?
- i. Who will track progress against technical milestones to bring issues to the attention of the joint venture and to NIST/TIP?
- j. In what capacity is a government laboratory participating? If as a joint venture member, is the government laboratory willing to execute the JVA? (NOTE: If it is not willing to execute the JVA, the government laboratory may possibly participate as a contractor under a separate agreement [e.g., a CRADA as addressed in Chapter 1. Section B.8] with the Joint Venture Administrator.)
- k. How will disputes be handled should they arise?
- l. How will project expenses be reported by joint venture members to the Joint Venture Administrator for reporting to NIST?

Before investing a large effort in planning technical work for a joint venture, organizations are urged to obtain a legal review of the sample JVA by all joint venture members. If it appears likely that reaching an agreement to the provisions contained in the sample JVA and Intellectual Property Plan will be contentious, TIP urges you to carefully consider whether the joint venture is feasible. If there are questions, your legal staff may contact the Office of the Chief Counsel for NIST at 301-975-2803.

TIP strongly recommends that the person who signs the proposal submission for the lead organization be someone at a high enough level in the organization to be able to deal effectively with the kinds of legal and policy concerns that are necessary to execute a successful JVA. It is often helpful if this same individual is the authorized signer of the JVA on behalf of the lead organization if the project is selected for funding. This individual must coordinate with top management within his/her own organization and the other participating organizations about their commitment and proposed cost-share contribution to the proposed project.