

## NTCPI

### NATIONAL TRANSPORTATION CAREER PATHWAY INITIATIVE

# TRANSPORTATION OPERATIONS

## CAREER PATHWAY REPORT

### SECTION 4 EXCERPT: IMPLEMENTATION PLAN

FEBRUARY 2019



STEPHANIE IVEY, DIRECTOR  
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SOUTHEAST TRANSPORTATION WORKFORCE CENTER



# Transportation Operations

## SECTION 4.0 CAREER PATHWAY IMPLEMENTATION

### 4.1 Project Title

**“Attracting Next-Gen Transportation Operations Professionals”**

### 4.2 Workforce Priority

An overarching theme in transportation operations is the necessity for a systems approach and the ever-changing impacts of technological advances. In the public sector, the rise of ITS has rapidly changed the competency requirements of its workforce. Transformative technologies dominate all areas of operations and occupy a key focus for both private employers and public agencies, whether from the standpoint of impact on efficiencies and the way business is conducted or challenges in attracting and retaining an appropriately skilled workforce. It is crucial to examine how we are preparing the workforce of the future to deal with disruptive/transformative technology and rapidly changing workplace demands.

In 2018, SETWC developed an approach to addressing these workforce challenges by focusing on career pathway solutions that provide demonstrable achievements for both students, in terms of articulating a continuum of learning and occupational opportunity, and employers, by providing a technically agile and comprehensively skilled talent pool. All research, education, and industry engagement efforts are guided by the FHWA stance that the nation’s ability to successfully deliver and manage an efficient, safe, and effective transportation system is dependent on the knowledge, skills, and abilities of the transportation workforce.

### 4.3 Project Description

A set of priority occupations within transportation operations was identified through collaboration with the Operations DWG and an extensive research effort that included literature review, labor market analysis, broad stakeholder surveys, and a validation feedback loop. The priority occupations identified span the operational areas of traffic, transit, and freight, and highlight a significant overlap across these segments of the transportation industry.

Additionally, four career clusters emerged from this analysis, including operations management, systems/operations engineering, operations research and data science, and operations



# Transportation Operations

technology. Documentation for 10 career pathways falling within these clusters was developed to launch this implementation project, each including a graphical career pathway model, priority job specifications, an associated program of academic study and/or training, and a catalog of relevant experiential learning programs designed to enhance student workplace skills.

In evaluating this occupational research and the readiness of the operations workforce, SETWC has designed a career pathway implementation that specifically addresses these findings:

- ***It is important to tell the story*** of transportation operations so that potential candidates understand the value of these workers in our society. By “putting a face” on these occupations, candidates better visualize themselves in these roles.
- ***Integrating experiential learning into academic programs*** through innovative interdisciplinary partnerships and demonstrating to students the opportunities available within transportation operations are key to developing career awareness and relevant competencies for the workforce of the future.

The primary initiatives that are part of this solution are:

1. **Transportation Operations Career Pathway Portal:** This engaging online web resource will allow users to explore a variety of career pathways through an interactive investigation of the skills, training, and education required to access these priority occupations. To demonstrate pathway accessibility, the portal will introduce students to a diverse group of industry professionals through a series of “Transportation Spotlights” that will help humanize and personalize these often-opaque career options.  
  
*Note: By June 30, 2019, SETWC will deploy a fully developed operations career path for a one priority occupation, to begin its demonstration of this portal initiative.*
2. **Transportation Operations Challenge Projects:** This initiative fosters a collaborative industry-academia approach to creating resources that demonstrate transportation operations careers through the development of exciting, interdisciplinary, real-world challenge projects that are relevant to existing curriculum and can be readily deployed within K-12, technical schools, community colleges, and 4-year universities.

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*Note: By June 30, 2019, SETWC will develop three challenge project statements (one for traffic, transit, and freight) and identify additional partners for pilot deployment.*

Beyond the initial efforts noted, SETWC proposes to fully develop an interactive web portal that includes resources for each of the priority occupations identified under NTCPI, and to develop an extensive repository of challenge projects that have been pilot tested and prepared for full-scale deployment to multiple institutions. Over the course of the four-year implementation period, more than 300 students are forecast to be impacted by this deployment.

Further, to maximize outreach to target student populations, promotional strategies will be deployed to engage faculty and students around Transportation Operations Challenge Projects and to increase the visibility and use of the Transportation Operations Career Pathway Portal.

Long-term, this plan provides for the extensive assessment and revision of products in order to ensure that users receive the resources that best address their interests and needs. SETWC will also look at opportunities to develop a rigorous longitudinal tracking program through a carefully designed research proposal submitted to a private foundation or government agency, such as the National Science Foundation, Department of Education, or Department of Labor.

## 4.4 Implementation Partners

SETWC thanks its partners for their continued engagement, contribution, and commitment to developing workforce solutions that positively impact the lives of students and the incumbent workforce. In their support of this career pathway pilot implementation for the transportation operations discipline, each of these valued partners have agreed to participate as key contributors to this plan's deployment, success, and long-term sustainability. SETWC's partner organizations, including their roles and responsibilities, are presented below:

**National Operations Center of Excellence (NOCoE):** Director Patrick Son is an active member of the Operations DWG and leads a variety of student-focused initiatives designed to increase interest in TSMO. Son will play a key role in implementation planning and expanding the deployment of initiatives to non-local partners. NOCoE is key to providing a venue for sustaining this resource long-term.



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**Tennessee Department of Transportation (TDOT):** TDOT already provides representatives to the Operations DWG, guest speakers for a pilot TSMO course developed/deployed by SETWC at the University of Memphis (UM) in Spring 2018, staff for workshops with high school students in SETWC's Summer Transportation Academy, and representatives for operations-related panels and sessions during UM hosted events like the annual [State of Freight Conference](#) and [Choosing Transportation Summit](#). TDOT will play an important role in implementation planning by helping develop transportation challenge projects, facilitating spotlights of transportation operations staff, and providing mentors for students in challenge project activities.



**Southwest Tennessee Community College (SWTCC):** Currently embarking on an effort to better align pre-engineering programs with UM's four-year engineering degree pathways, SWTCC offers an excellent opportunity for piloting Transportation Operations Challenge Projects and deploying the Transportation Operations Career Pathway Portal with students.



**East High Transportation-STEM (T-STEM) Academy:** A result of SETWC's partnership with Shelby County Schools, the [T-STEM Academy](#) is a perfect setting for integrating both challenge projects and the web portal at the high school level. Strong industry-academia partnerships will also facilitate pilot deployment of challenges and engagement of professional and student (college) mentors with participating T-STEM students.



**Gannett Fleming:** Vice President Eric Rensel is a prominent member of the Operations DWG and national leader in the Institute of Transportation Engineers. Through Rensel's leadership, Gannett Fleming will partner on the challenge project initiative to help develop project statements, provide mentors, and to identify opportunities for scale and replication.



**TRC Engineering:** Memphis-area Transportation Operations Project Engineer Michael Rebick will lead TRC's engagement efforts in the challenge project initiative, by providing input to project statements, mentors, and developing opportunities for scale and replication.



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As implementation scales beyond the demonstration pilots, these partnerships will be tapped to leverage their expertise and networks to expand the initiatives:

**Institute of Transportation Engineers (ITE):** Several ITE members participate in the Operations DWG, and locally TSITE has been very active with both UM and the T-STEM Academy. These alliances will continue to play a prominent role in finalizing implementation planning and pilot deployments. ITE's role will increase in importance with full-scale implementation, due to its ability to engage members through local, section, district, and national venues.



**Greater Memphis IT Council:** As an industry partner, this council offers significant local expertise in transportation operations through its public and private-sector members and is targeted to become a prime candidate for engagement in local pilot initiatives.



*To achieve scale, existing relationships with NOCoE, ITE, TRB standing committees, and other Operations DWG members will be leveraged to identify additional partners to achieve regional and national replication goals.*

## 4.5 Partner Commitments

In an expression of their commitment to the deployment and mission of this implementation plan, SETWC partners have “signed-on” as key contributors of time, expertise, resources, and in some cases funding, through the authorized letters of agreement presented below. It is this level of engagement that makes a program of this scale possible.



# Transportation Operations



November 26, 2018

Dr. Stephanie Ivey, Director  
Southeast Transportation Workforce Center  
University of Memphis  
202B Engineering Administration  
Memphis, TN 38152

RE: National Transportation Career Pathways Initiative  
Operations Career Pathway Implementation Partnership

Dear Dr. Ivey,

Gannett Fleming is pleased to partner with the Southeast Transportation Workforce Center (SETWC) in the deployment of a career pathway program for the transportation operations workforce. Gannett Fleming is firmly committed to advancing the transportation operations workforce through investing time in initiatives that promote operations careers and inspire the next generation workforce. We believe partnering with SETWC in this venture is in direct alignment of this goal.

We understand the proposed project seeks to expand awareness of and interest in priority occupations in the transportation operations discipline, by offering K-12 and post-secondary students opportunities to participate in real-world operations projects that engage them in exciting problems to illuminate the important role of transportation operations professionals.

As a lead project partner, we intend to participate in the following ways:

- Participate in overall challenge model development process.
- Provide leadership in developing operations challenge projects.
- Provide staff to serve as mentors to students participating in operations challenges.
- Work collaboratively to identify opportunities for scale and replication.
- Attend and participate in all Operations discipline working group meetings.

Gannett Fleming is highly supportive of this initiative and we look forward to working with SETWC to provide students with better understanding of and motivation to pursue career opportunities in transportation operations.

Sincerely,

  
Eric Rensel  
Vice President  
Gannett Fleming, Inc.

Gannett Fleming, Inc.  
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December 21, 2018

Dr. Stephanie Ivey, Director  
Southeast Transportation Workforce Center  
University of Memphis  
202B Engineering Administration  
Memphis, TN 38152

RE: National Transportation Career Pathways Initiative  
Operations Career Pathway Implementation Partnership

Dear Dr. Ivey,

The National Operations Center of Excellence (NOCoe) is pleased to partner with the Southeast Transportation Workforce Center (SETWC) in the deployment of a career pathway program for the transportation operations workforce. NOCoe is firmly committed to advancing the transportation operations workforce through investing time in initiatives that promote operations careers and inspire the next generation workforce, and is leading numerous initiatives in this area. We believe partnering with SETWC in this venture is in direct alignment with our mission.

We understand the proposed project seeks to expand awareness of and interest in priority occupations in the transportation operations discipline, by offering K-12 and post-secondary students opportunities to participate in real-world operations projects that engage them in exciting problems to illuminate the important role of transportation operations professionals.

As a lead project partner, we intend to participate in the following ways:

- Participate in overall challenge model development process.
- Provide leadership in developing operations challenge projects.
- Help identify mentors for students participating in operations challenges.
- Work collaboratively to identify opportunities for scale and replication.
- Investigate options for sustaining this program through NOCoe.
- Attend and participate in all Operations discipline working group meetings.

NOCoe is highly supportive of this initiative and we look forward to working with SETWC to provide students with better understanding of and motivation to pursue career opportunities in transportation operations.

Sincerely,

  
Patrick Son, P.E.  
Managing Director  
National Operations Center of Excellence



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November 26, 2018

Dr. Stephanie Ivey, Director  
Southeast Transportation Workforce Center  
University of Memphis  
202B Engineering Administration  
Memphis, TN 38152

RE: National Transportation Career Pathways Initiative  
Operations Career Pathway Implementation Partnership

Dear Dr. Ivey,

Southwest Tennessee Community College (SWTCC) is pleased to partner with the Southeast Transportation Workforce Center (SETWC) in the deployment of a career pathway program for the transportation operations workforce. SWTCC recognizes the importance of transportation in our regional economy and is firmly committed to creating clear career pathways and transfer opportunities for our students in operations-related disciplines. We believe partnering with SETWC in this venture is in direct alignment of our goals.

We understand the proposed project seeks to expand awareness of and interest in priority occupations in transportation operations, by offering K-12 and post-secondary students opportunities to participate in real-world operations projects that engage them in exciting problems to illuminate the important role of transportation operations professionals.

As a lead project partner, we intend to participate in the following ways:

- Participate in overall challenge model development process.
- Provide leadership in identifying relevant SWTCC programs and transfer pathways.
- Identify courses/faculty for challenge project implementation.
- Work collaboratively to identify opportunities for scale and replication.
- Attend and participate in all Operations discipline working group meetings.

SWTCC is highly supportive of this initiative and we look forward to working with SETWC to provide students with better understanding of and motivation to pursue career opportunities in transportation operations.

Sincerely,

  
Anita Brackin  
Associate Vice President, Workforce, Economic Development & Continuing Education  
Southwest Tennessee Community College  
(o) 901-333-4018  
(m) 901-605-9399  
abrackin1@southwest.tn.edu

Marion Grove Campus • Union Avenue Campus • Fayette Site • Gill Center • Maxine A. Smith Center • Millington Center • Whitehaven Center

Southwest Tennessee Community College, a Tennessee Board of Regents institution, is an affirmative action/equal opportunity college.



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JOHN C. SCHROEDER  
COMMISSIONER

BILL HASLAM  
GOVERNOR

December 14, 2018

Dr. Stephanie Ivey, Director  
Southeast Transportation Workforce Center  
University of Memphis  
202B Engineering Administration  
Memphis, TN 38152

RE: National Transportation Career Pathways Initiative  
Operations Career Pathway Implementation Partnership

Dear Dr. Ivey,

The Tennessee Department of Transportation (TDOT) is pleased to partner with the Southeast Transportation Workforce Center (SETWC) in the deployment of a career pathway program for the transportation operations workforce. TDOT is firmly committed to advancing the transportation operations workforce through investing time in initiatives that promote operations careers and inspire the next generation workforce. We believe partnering with SETWC in this venture is in direct alignment with our shared mission.

We understand the proposed project seeks to expand awareness of and interest in priority occupations in the transportation operations discipline, by offering K-12 and post-secondary students opportunities to participate in real-world operations projects that engage them in exciting problems to illuminate the important role of transportation operations professionals.

As a lead project partner, we intend to participate in the following ways:

- Attend Operations Discipline Working Group meetings.
- Participate in overall challenge model development process.
- Provide leadership in developing operations challenge projects.
- Identify TDOT mentors for students participating in operations challenges.
- Work collaboratively to identify opportunities for scale and replication, particularly by replicating in other TDOT regions across the state.

TDOT is highly supportive of this initiative and we look forward to working with SETWC to provide students with better understanding of and motivation to pursue career opportunities in transportation operations.

Sincerely,

  
Brad Freeze, PE  
Director, TDOT Traffic Operations Division

# Transportation Operations



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November 29, 2018

Dr. Stephanie Ivey, Director  
Southeast Transportation Workforce Center  
University of Memphis  
202B Engineering Administration  
Memphis, TN 38152

RE: National Transportation Career Pathways Initiative  
Operations Career Pathway Implementation Partnership

Dear Dr. Ivey,

TRC Engineering, Inc. (TRC) is pleased to partner with the Southeast Transportation Workforce Center (SETWC) in the deployment of a career pathway program for the transportation operations workforce. TRC is firmly committed to advancing the transportation operations workforce through investing time in initiatives that promote operaticus careers and inspire the next generation workforce. We believe partnering with SETWC in this venture is in direct alignment of this goal.

We understand the proposed project seeks to expand awareness of and interest in priority occupations in the transportation operations discipline, by offering K-12 and post-secondary students opportunities to participate in real-world operations projects that engage them in exciting problems to illuminate the important role of transportation operations professionals.

As a lead project partner, we intend to participate in the following ways:

- Participate in overall challenge model development process.
- Provide leadership in developing operations challenge projects.
- Provide staff to serve as mentors to students participating in operations challenges.
- Work collaboratively to identify opportunities for scale and replication.
- Attend and participate in all Operations discipline working group meetings.

TRC is highly supportive of this initiative and we look forward to working with SETWC to provide students with better understanding of and motivation to pursue career opportunities in transportation operations.

Sincerely,

Michael F. Rebeck, PE  
Transportation Operations Project Engineer  
[mrebeck@trcsolutions.com](mailto:mrebeck@trcsolutions.com)



Lischa T. Brooks  
Executive Principal



December 13, 2018

Dr. Stephanie Ivey, Director  
Southeast Transportation Workforce Center  
University of Memphis  
202B Engineering Administration  
Memphis, TN 38152

RE: National Transportation Career Pathways Initiative  
Operations Career Pathway Implementation Partnership

Dear Dr. Ivey,

As Executive Principal of East High T-STEM Academy, I am pleased to confirm our partnership with the Southeast Transportation Workforce Center (SETWC) in the deployment of a career pathway program for the transportation operations workforce. I recognize the importance of transportation in our regional economy and am committed to ensuring T-STEM students are aware of the diverse opportunities available to them through transportation careers. I believe partnering with SETWC in this venture is in direct alignment with the goals for T-STEM.

I understand the proposed project seeks to expand awareness of and interest in priority occupations in transportation operations, by offering K-12 and post-secondary students opportunities to participate in real-world operations projects that engage them in exciting problems and illuminate the important role of transportation operations professionals.

As a lead project partner, we intend to participate in the following ways:

- Participate in overall challenge model development process.
- Provide leadership in identifying relevant high school courses or extracurricular options for integrating challenges.
- Work collaboratively to identify opportunities for scale and replication.
- Attend and participate in Operations discipline working group meetings.

T-STEM Academy is highly supportive of this initiative and we look forward to working with SETWC to provide students with better understanding of and motivation to pursue career opportunities in transportation operations.

Sincerely,



# Transportation Operations

## 4.6 Project Outcomes

Current year activities are focused on developing an initial model for the operations career pathway resource, industry-academia and interdisciplinary partnerships, and problem statements for Transportation Operations Challenge Projects. Future years will focus on expanding the web resource and development and deployment of challenge projects into a variety of educational settings. Impact will be evaluated through documentation of web resource use, pre/post-surveys of challenge project participants, and the tracking of students pursuing operations careers. The expected outcomes for a 2019-2020 deployment include:

### **First-Year Outcomes: Transportation Operations Career Pathway Portal**

1. Online, interactive career pathways will be fully developed for all operations career clusters, with a minimum of 5 spotlights per occupation.
2. A promotional strategy and campaign will be developed/deployed to increase awareness of the web portal, with outreach taking place through SETWC stakeholders and professional organizations/networks NNTW, ITE, NOCoE, and CUTC.
3. Portal site tracking will determine use and impact of awareness strategies.

### **First-Year Outcomes: Transportation Operations Challenge Projects**

1. Three challenge projects will be deployed into higher education during the Fall 2019 semester, impacting 30 students. Assessment instruments will be developed, distributed, and evaluated to refine each challenge project, and final project descriptions will be shared online via SETWC and NOCoE websites.
2. Full-scale deployment will occur in Spring of 2020, with three higher-ed institutions in multiple states using each of the three projects within a course. A minimum of 90 students will participate in challenge projects and program evaluation. The Spring 2020 cohort will be developed through existing relationships with faculty who are teaching courses relevant to challenge projects offered at other institutions.
3. Promotional materials will be developed using pictures and quotes from challenge project participants to increase awareness of and interest in the delivery of these projects at higher-ed institutions across the country. A comprehensive awareness campaign (newsletters, social media, website) during early 2020 will recruit participants for the

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Fall semester. In addition to SETWC stakeholders, outreach will take place through professional organizations and national networks like NNTW, ITE, NOCoE, and CUTC.

4. Three challenge projects will be modified for use in K-12 classrooms and piloted at three schools during the 2019-2020 academic year, with 50 students participating.
5. Three additional projects will be developed in 2019-2020 for piloting in 2020-2021.

## 4.7 Project Timeline

The proposed initiative activities for 2019-2020 are outlined below:

### Transportation Operations Career Pathway Portal

- |   |                  |
|---|------------------|
| 1. Develop transportation operations profile sheet<br><i>(for promotion of portal and challenge projects)</i> | August 2019      |
| 2. Develop interactive pathways for first career cluster  | April 2020       |
| 3. Finalize pathways in online portal based on DWG input  | June 2020        |
| 4. Develop tracking system  | June 2020        |
| 5. Report on project status   | Quarterly        |
| 6. Meet with Operations DWG   | Quarterly        |
| 7. Repeat 1-4 for remaining career clusters   | April 2021/22/23 |
| 8. Develop national promotional strategy  | March 2020       |
| 9. Deploy marketing strategy (ongoing)  | December 2020    |
| 10. Track portal users and impact   | Annual           |
| 11. Meet with Operations DWG for review   | Quarterly        |
| 12. Final implementation plan impact report   | June 2023        |

### Transportation Operations Challenge Projects

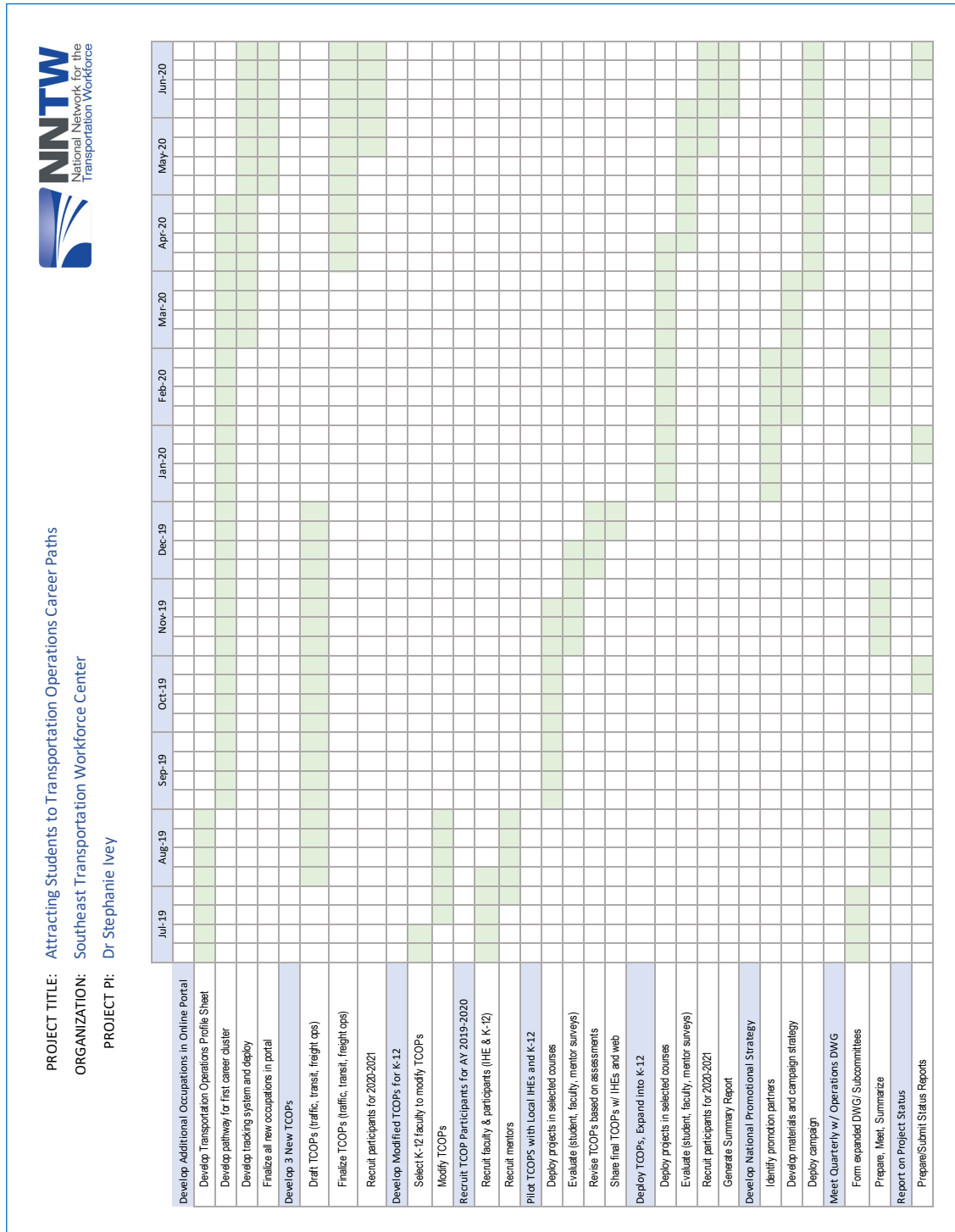
- |   |               |
|---|---------------|
| 1. Recruit project participants for AY 2019-2020<br><i>(includes faculty, students, industry mentors)</i> | Summer 2019   |
| 2. Develop modified challenge projects for K-12   | Summer 2019   |
| 3. Pilot projects with local academic partners<br><i>(evaluate/survey students and partners)</i>          | December 2019 |
| 4. Deploy projects with expanded multi-state partners   | Spring 2020   |
| 5. Develop national recruitment strategy  | March 2020    |
| 6. Deploy marketing strategy (ongoing)  |               |

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- |  |                 |
|--|-----------------|
| 7. Develop three new challenge projects  | May 2020        |
| 8. Recruit participants for AY 2020-2021   | June 2020       |
| 9. Repeat 1-4, 6-7 for expanded projects/partners<br><i>(15 projects impacting 300 students and 50 partners)</i> | June 2021/22/23 |
| 10. Report on project status   | Quarterly       |
| 11. Meet with Operations DWG for review  | Quarterly       |
| 12. Final implementation plan impact report  | June 2023       |

# Transportation Operations

## 4.8 First Year Workplan



(end of report)