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ECONOMIC IMPACT

SITE DEVELOPMENT GRANT PROGRAMS ACROSS TENNESSEE

2016-2022 ECONOMIC IMPACT
AND CASE STUDY ANALYSIS

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TN Department of Economic & Community Development

Center for Rural Innovation
TENNESSEE TECH

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TNECD ECONOMIC IMPACT 2016-2022
SITE DEVELOPMENT GRANTS

143 GRANTS AWARDED

66 COUNTIES BENEFITED FROM GRANTS

103 SITES IMPROVED

$3.2M GENERATED IN STATE TAXES

6,432 INCREASE IN JOBS CREATED FROM LANDED COMPANIES ON SDG SITES

$3.1B CAPITAL INVESTMENT GENERATED BY LANDED COMPANIES

$58,005,345

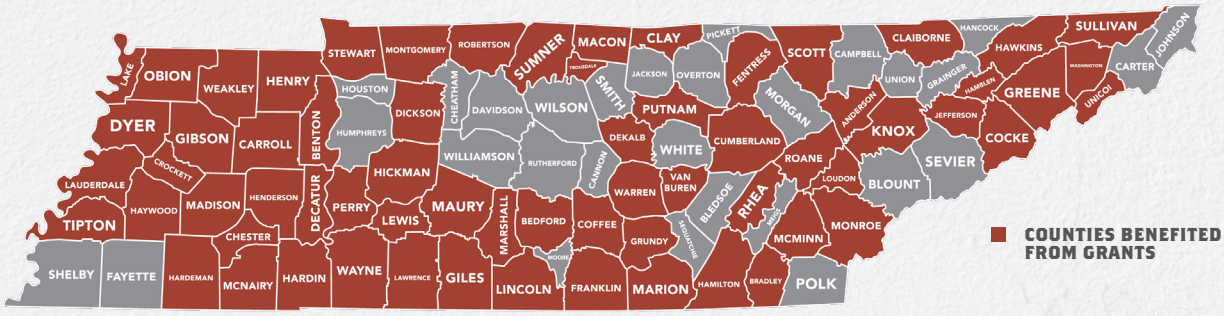
INVESTED BY TNECD IN RURAL COMMUNITIES SINCE 2016

$35,602,002

CREATED IN LABOR INCOME

$157.7 M

INCREASE IN TENNESSEE'S CONSTRUCTION & ENGINEERING SERVICES INDUSTRIES



RESEARCH PROVIDED BY TENNESSEE TECH UNIVERSITY CENTER FOR RURAL INNOVATION AND RURAL REIMAGINED GRAND CHALLENGE UTILIZING IMPLAN® CLOUD, 2022 DATA, USING INPUTS PROVIDED BY THE USER AND IMPLAN GROUP LLC, IMPLAN SYSTEM (DATA AND SOFTWARE), 16905 NORTHCROSS DR., SUITE 120, HUNTERSVILLE, NC 28078 WWW.IMPLAN.COM
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Foreword

In 2018, the Community and Rural Development Division of the Tennessee Department of Economic and Community Development (TNECD) set out to evaluate its programs' overall impacts and effectiveness to align with Governor Lee's commitment to drive rural prosperity across Tennessee. The initial effort began as an analysis to provide local governments, rural partners, and other stakeholders with access to programs that have demonstrated success to help them advance rural economies. Today, with a complete economic impact study provided by Tennessee Tech University through the Rural Reimagined Program, this vision has turned into a reality.

The summary report in the following pages lays out reasoning to be excited about the future of the community and rural development programs and shows how continued new investments in site development will help Tennessee communities for years to come. In total, 66 of Tennessee's 95 counties have taken advantage of the Site Development Grant (SDG) program. The research in this report shows significant economic impacts from this grant funding, leading to new jobs, capital investment, economic growth, and increased state and local tax revenue.

TNECD's mission is to enhance Tennessee's competitiveness by driving job creation, generating economic growth, and facilitating community development. The SDG program is a pillar of this mission and a defining factor in Tennessee's success as a leader in economic development. We hope the findings in this report will help guide elected officials, policymakers, and community and business leaders as they make decisions about future rural investment and the continued prosperity of our great state.

Stuart C. McWhorter
Commissioner

TN Department of Economic & Community Development

Michael Aikens, MPS
Director

Center for Rural Innovation
TENNESSEE TECH

SUMMARY OF STUDY FINDINGS

This report estimates the economic impacts arising from the SDG program and identifies additional expected and quantified effects through this study. Overall objectives include:

- Understanding the economic impact of SDG across the state of Tennessee.
- Identifying the quantifiable value of SDG with economic growth, job creation, increased income for residents, and overall community investment.
- Gathering evidenced-based data for communities, legislators, and other stakeholders to support informed decision-making about future investments for rural priorities and policies.

While it is easy to count the number of jobs and dollars invested in these sites once a company has landed, it is difficult to define the but-for provision that makes SDG the sole predictor of these outcomes. The summary report in the following pages seeks to draw the through-line between SDG dollars and true economic output. The results of this study show that 1 dollar of SDG funding directly correlates to more than 1.5 dollars in total economic output for the State of Tennessee. This result does not include the wages, taxes, jobs, and capital investment that are created after a business lands on a site improved by SDG. To be clear, the jobs created and named in this report are a by-product of the funds invested, not the intended purpose or outcome of the program. SDG funding is intended to create a viable industrial product so that companies have reduced barriers to locating, creating jobs, and investing in our most rural communities.

OVERALL ESTIMATED SITE DEVELOPMENT GRANT IMPACT TO THE STATE 2016-2022*

The overall impact of 136 TNECD SDG site preparation and due diligence/planning projects from 2016-2022, totaling $81,340,265 in project costs includes:

- $53,845,324 in created labor income
- Average of 125 construction and engineering-related Tennessee-based jobs annually
- $157,725,482 in increased output in Tennessee's construction and engineering services industries
- $1,019,428 in local taxes generated
- $1,335,618 in county taxes generated
- $3,297,973 in state taxes generated

**As of January 2023, a total of 143 SDG projects have been funded by TNECD.This study does not include an analysis of seven SDG projects for property purchase, bringing the total number of analyzed grants to 136.*

Site Development Grant Program Economic Impact Research

This section describes research conducted to investigate and analyze the economic impacts of TNECD's SDG Program from 2016 and 2022. Tennessee Tech University's Center for Rural Innovation (TCRI) conducted the research in collaboration with TNECD, who provided the requisite program data, definitions, and parameters. The goals of the research and its significance to the state were twofold: i) to provide programmatic estimated economic impacts, both statewide and per-project and ii) to develop tools that assist in planning, assessment, and evaluation of state-wide and project-level grant program performance.

TNECD Site Development Grant Program Activity 2016-2022

In 2016, the SDG program was created as part of the Rural Economic Opportunity (REO) Act and as a response to the increased need for shovel-ready industrial products in the most rural areas of Tennessee. This program coupled well with the existing Property Evaluation and Select Tennessee Certified Sites Programs to deliver grant funding for site improvements that eliminate time and risk associated with landing companies that create jobs and invest capital in these rural areas. As Tennessee has shown success in industrial attraction and growth, the SDG program has become an increasingly important factor in keeping up with industrial inventory demands.

Since 2016, the state has invested over $54 Million in industrial property in 66 counties. This funding allows communities to leverage their dollars to prepare sites for companies that can create jobs and invest capital. While the spirit of the program has remained much the same, TNECD has been responsive to communities' needs regarding the level of funding necessary to deliver results that meet the market demands of the companies they are seeking to attract. As of January 2023, TNECD reports 20 projects have landed on sites that have been improved using SDG funding, amounting to over 6,400 new jobs and over $3.1 Billion in capital investment.

Appendix Table 1 presents the state-wide grant activity for SDG from 2016 through 2022 analyzed in this report. In summary, the State-administered 136 grants that totaled $53,604,523 in state investments. Additionally, $27,735,742 in leverage was contributed to the projects totaling $81,340,265 in project costs. Leverage includes matching funds that communities are required to put into the project based on program guidelines.

METHODOLOGY

First, this study analyzed the economic impacts of SDG using the IMPLAN economic analysis modeling application. Next, a quantitative, deductive approach was utilized to statistically test for inferential evidence to provide empirical findings regarding the economic impact and performance metrics of SDG projects. An in-depth narrative describing the methodology and procedures follows.

KEY ASSUMPTIONS

This study notes the following key assumptions:

1. All project data provided by grant recipients are assumed to be accurate.
2. Jobs created and named in this report are a by-product of funds invested during the grant period and do not include the jobs related to company locations on sites improved using SDG dollars.
3. No economic modeling software can estimate economic impacts with 100% certainty; however, IMPLAN, the industry-standard economic modeling software utilized in this study, is assumed to provide reliable results within the industry and geographies studied. Additional IMPLAN input-output modeling assumptions are located on IMPLAN's website.

ECONOMIC IMPACT ANALYSIS WITH IMPLAN

This study utilized the IMPLAN Cloud (IMPLAN) application to model the economic impacts of SDG. To conduct the economic impact analysis in IMPLAN, researchers utilized a dataset that contained information about 136 SDG projects from 2016 through 2022. The data from each project was individually analyzed in IMPLAN to estimate the economic impacts of the program at the county and state-wide geographic levels.

IMPLAN is a cloud-based application that features a suite of datasets, algorithms, and input-output methodology that model the economic multiplier effects experienced by industries (such as engineering services and construction) in reaction to an economic event (such as grant programs) occurring within a specified local economic area (Tennessee). IMPLAN provided the study with reliable data models that enabled the researchers to investigate and produce estimated economic impacts resulting from the SDG programs.

The SDG program provides investments across three separate categories: site preparation, due diligence/planning, and property purchases. The recipients of SDG funding were governmental entities within Tennessee. This study analyzed the economic impacts of site preparation and due diligence/planning activities. Property purchases were not analyzed because these purchases do not create measurable changes to industrial production that can be analyzed in IMPLAN.

- **Site preparation** includes construction-related activities that increase the marketable positioning of an industrial site. Examples of site preparation investments include utility extensions, access road construction, and site grading, among others.
- **Due diligence/planning** includes engineering-related services such as environmental, hydrological, cultural, and geotechnical surveys that provide vital information necessary to move forward with the purchase and/or construction activities on an industrial site.
- **Property purchases** include the purchase of land that has the components necessary for industrial development. This could include the expansion of a business or industrial park or other property in cases where additional site development would make the site more marketable. Property purchases were not analyzed in this study.

Because spending patterns vary greatly across different industry sectors, it is imperative for economic impact research to accurately represent the specific industries studied. Therefore, grant recipient data was grouped into two distinct categories that provide a basis to determine the appropriate industry crosswalk specification within IMPLAN. These categories were site preparation and due diligence/planning. For site preparation, the respective industry was IMPLAN Sector 60 - Maintenance and repair construction of nonresidential structures (construction). For due diligence/planning, the respective industry was IMPLAN Sector 457 – Engineering services. IMPLAN's industry spending patterns and input ratios are derived from expenditure patterns provided by the U.S. Bureau of Economic Analysis (BEA) and Bureau of Labor Statistics (BLS).

The results provided by IMPLAN included the direct, indirect, and induced effects resulting from SDG. The sum of these multiplier effects represents the total economic impact on the studied industries in Tennessee.

- **Direct effects** are the initial changes in local economies as a result of spending.
- **Indirect effects** are the business-to-business purchases within the region's supply chain stemming from industry input purchases.
- **Induced effects** are the values stemming from household spending of labor Income, after the removal of taxes, savings, and commuter income.

The total economic impact of the multiplier effects can be observed across a variety of economic indicators within IMPLAN. For this study, TNECD identified employment, labor income, output, and taxes as the primary economic indicators of interest. TNECD's mission is to enhance Tennessee's competitiveness by driving job creation, generating economic growth, and facilitating community development. The indicators identified are primary measures of growth and critical to propelling economic and community development across Tennessee.

- **Employment** is the annual average of Tennessee-based jobs supported within the studied industries. The results are an industry-specific mix of jobs, as defined by the BEA and BLS, supported by economic events. Employment is reported in terms of averages because some jobs are sustained, and some are lost every year. The net effect is best reflected in the expression of average annual jobs.

- **Labor income** represents the total income generated by the various forms of employment income, including employee wages, salaries, and benefits resulting from economic events.
- **Output** is the value of production catalyzed within an industry, during one calendar year, in response to economic events.
- **Local taxes** are the sub-county general-level taxes generated by an economic event.
- **County taxes** are the county-level taxes generated by an economic event.
- **State taxes** are the state-level taxes generated by an economic event.

SITE PREPARATION ANALYSIS

To estimate the impacts of site preparation, an industry output event type in IMPLAN was used to measure the increase in Tennessee's construction industry output. Industry output event types represent the change in the value of industry production in response to an economic event. **Appendix Table 2 (Panel A and Panel B)** presents the reported annual impacts. In summary, the site preparation costs of 96 grants, totaling $73,165,286, supported an average of 118 Tennessee-based jobs annually, created $50,479,761 in labor income, increased output in Tennessee's construction industry by $150,414,765, and generated $5,423,895 in local, county, and state taxes.

DUE DILIGENCE AND PLANNING ANALYSIS

To estimate the impacts of due diligence/planning, an industry output event type in IMPLAN was used to measure the increase in Tennessee's engineering services industry output. Industry output event types represent the change in the value of industry production in response to an economic event. **Appendix Table 3 (Panel A and Panel B)** presents the reported annual impacts. In summary, the due diligence/planning costs of 40 grants, totaling $3,888,979, supported an average of 10 Tennessee-based jobs annually, created $3,438,808 in labor income, increased output in Tennessee's engineering services industry by $7,745,529, and generated $229,124 in local, county, and state taxes.

SITE PREPARATION STATISTICAL ANALYSIS

This section describes the statistical tests used to make inferences about the economic impacts of site preparation. The IMPLAN results from 96 site preparation projects were collected and statistically analyzed. This sample contained data, obtained from IMPLAN, regarding total project cost, employment, labor income, output, local taxes, county taxes, and state taxes for each site preparation project.

First, multiple bivariate correlations were used to test for relationships between the total project cost to employment, labor income, output, local taxes, county taxes, and state taxes. The results showed that each variable was significantly related and demonstrated very strong effect sizes of $r = .796$ and above ($p < .001$). Accordingly, a series of simple linear regressions were conducted to determine the predictive values of one dollar of the total project cost to employment, labor income, output, local taxes, county taxes, and state taxes. The results of these simple linear regressions were used to develop tools for future program evaluations. **Appendix Table 4** summarizes the findings of the simple linear regression tests.

DUE DILIGENCE/PLANNING STATISTICAL ANALYSIS

This section describes the statistical tests used to make inferences about the economic impacts of due diligence/planning. The IMPLAN results from 40 due diligence/planning projects were collected and statistically analyzed. This sample contained data, obtained from IMPLAN, regarding total project cost, employment, labor income, output, county taxes, and state taxes for each site preparation project.

First, multiple bivariate correlations were used to test for relationships between the total project cost to employment, labor income, output, local taxes, county taxes, and state taxes. The results showed that each variable was significantly related and demonstrated very strong effect sizes of $r = .738$ and above ($p < .001$). Accordingly, a series of simple linear regressions were conducted to determine the predictive values of one dollar of the total project cost to employment, labor income, output, local taxes, county taxes, and state taxes. The results of these simple linear regressions were used to develop tools for future program evaluations. **Appendix Table 5** summarizes the findings of the simple linear regression tests.

ECONOMIC IMPACT CONCLUSIONS

This section presents the research conclusions of the estimated total economic impact on the state of Tennessee resulting from the SDG programs from 2016 through 2022. The findings were obtained from a combination of analyzing TNECD datasets, IMPLAN multiplier outcomes, and inferential statistical tests as described in the preceding sections. Results from the statistical tests for each industry studied were summed to estimate the overall state-wide impact of SDG.

The value stemming from this economic impact analysis research was to determine the economic impacts of SDG in Tennessee and to develop tools that could assess and evaluate current and future SDG programming initiatives. As presented in the tables below, the economic impacts are clearly illustrated to have positively impacted the State.

YEAR	GRANTS	TOTAL COST	EMPLOYMENT	LABOR INCOME	OUTPUT
2016	15	$7,707,565	89	$5,072,972	$15,078,852
2017	18	$10,267,840	116	$6,729,822	$20,028,735
2018	24	$14,389,967	158	$9,509,470	$27,998,535
2019	31	$14,520,333	188	$11,604,363	$33,588,165
2020	10	$4,132,168	45	$2,877,170	$7,932,655
2021	26	$14,389,139	164	$10,384,842	$30,680,890
2022	16	$11,647,253	118	$7,666,685	$22,417,650
TOTAL:	136	$77,054,265	125*	$53,845,324	$157,725,482

**Employment totals are reported as annual averages.*

YEAR	LOCAL TAXES	COUNTY TAXES	STATE TAXES
2016	$105,675	$138,439	$322,202
2017	$136,974	$179,442	$425,487
2018	$183,725	$240,705	$585,153
2019	$214,488	$281,038	$696,586
2020	$49,661	$65,079	$169,150
2021	$191,893	$251,401	$637,755
2022	$137,013	$179,514	$461,639
TOTAL:	$1,019,428	$1,335,618	$3,297,973

Appendix

TABLE 1

The summary of SDG activity 2016-2022 is presented in this table.

INVESTMENT CATEGORY	GRANTS	TNECD INVESTMENT	LEVERAGE	TOTAL COST
2016				
SITE PREPARATION	15	$5,760,585	$1,946,980	$7,707,565
2017				
SITE PREPARATION	18	$6,247,383	$4,020,457	$10,267,840
2018				
SITE PREPARATION	17	$8,267,583	$5,585,338	$13,852,921
DUE DILIGENCE/PLANNING	7	$361,057	$175,989	$537,046
2019				
SITE PREPARATION	14	$8,554,007	$7,173,854	$15,727,861
DUE DILIGENCE/PLANNING	15	$1,136,075	$421,397	$1,557,472
2020				
SITE PREPARATION	5	$2,023,019	$1,440,472	$3,463,491
DUE DILIGENCE/PLANNING	5	$362,179	$306,498	$668,677
2021				
SITE PREPARATION	18	$12,404,819	$3,067,816	$15,472,635
DUE DILIGENCE/PLANNING	6	$354,487	$83,017	$437,504
2022				
SITE PREPARATION	9	$7,544,853	$3,414,120	$10,958,973
DUE DILIGENCE/PLANNING	7	$588,476	$99,804	$688,280
TOTAL:	**136**	**$53,604,523**	**$27,735,742**	**$81,340,265**

TABLE 2 - PANEL A.

Site preparation economic impacts 2016-2022. Summary of awarded grants, total project costs, employment, labor income, and output. *Employment totals are reported as annual averages.

YEAR	GRANTS	TOTAL COST	EMPLOYMENT	LABOR INCOME	OUTPUT
2016	15	$7,707,565	89	$5,072,972	$15,078,852
2017	18	$10,267,840	116	$6,729,822	$20,028,735
2018	17	$13,852,921	150	$9,032,207	$26,922,002
2019	14	$12,962,861	167	$10,224,169	$30,477,489
2020	5	$3,463,491	36	$2,359,504	$7,036,751
2021	18	$13,951,635	158	$9,999,289	$29,813,326
2022	9	$10,958,973	110	$7,061,797	$21,057,611
TOTAL:	96	$73,165,286	118*	$50,479,761	$150,414,765

TABLE 2 - PANEL B.

Site preparation economic impacts 2016-2022. Summary of local, county, and state taxes generated from site preparation projects.

YEAR	LOCAL TAXES	COUNTY TAXES	STATE TAXES
2016	$105,675	$138,439	$322,202
2017	$136,974	$179,442	$425,487
2018	$177,980	$233,161	$566,138
2019	$198,166	$259,606	$641,602
2020	$42,796	$56,065	$145,731
2021	$187,493	$245,624	$622,554
2022	$130,233	$170,611	$437,916
TOTAL:	$979,316	$1,282,948	$3,161,631

TABLE 3 - PANEL A.
Due diligence/planning, economic impacts 2018-2022. Summary of awarded grants, total project costs, employment, labor income, and output. *Employment totals are reported as annual averages.

YEAR	GRANTS	TOTAL COST	EMPLOYMENT	LABOR INCOME	OUTPUT
2018	7	$537,046	7	$477,262	$1,076,534
2019	15	$1,557,472	20	$1,380,194	$3,110,676
2020	5	$668,677	8	$590,911	$1,330,716
2021	6	$437,504	5	$385,553	$867,564
2022	7	$688,280	8	$604,888	$1,360,039
TOTAL:	40	$3,888,979	10*	$3,438,808	$7,745,529

TABLE 3 - PANEL B.
Summary of local, county, and state taxes generated from due diligence/planning projects 2018-2022.

YEAR	LOCAL TAXES	COUNTY TAXES	STATE TAXES
2018	$5,745	$7,544	$19,015
2019	$16,321	$21,432	$54,984
2020	$6,864	$9,014	$23,419
2021	$4,400	$5,777	$15,201
2022	$6,780	$8,904	$23,723
TOTAL:	$40,111	$52,671	$136,342

TABLE 4

Summary of SDG site preparation investment impacts simple linear regression test results.

PREDICTOR VARIABLE	OUTCOME VARIABLE	COEFFICIENT	LOWER BOUND	UPPER BOUND
TOTAL PROJECT COST	EMPLOYMENT	0.00000815	0.00000790	0.00000839
TOTAL PROJECT COST	LABOR INCOME	0.459	0.438	0.480
TOTAL PROJECT COST	OUTPUT	1.573	1.524	1.621
TOTAL PROJECT COST	LOCAL TAXES	0.004	0.003	0.004
TOTAL PROJECT COST	COUNTY TAXES	0.005	0.004	0.006
TOTAL PROJECT COST	STATE TAXES	0.022	0.020	0.024

TABLE 5

Summary of SDG due diligence/planning investment impacts simple linear regression test results.

PREDICTOR VARIABLE	OUTCOME VARIABLE	COEFFICIENT	LOWER BOUND	UPPER BOUND
TOTAL PROJECT COST	EMPLOYMENT	0.00001278	0.00001160	0.00001400
TOTAL PROJECT COST	LABOR INCOME	0.579	0.491	0.667
TOTAL PROJECT COST	OUTPUT	1.517	1.395	1.639
TOTAL PROJECT COST	LOCAL TAXES	0.003	0.002	0.003
TOTAL PROJECT COST	COUNTY TAXES	0.006	0.004	0.007
TOTAL PROJECT COST	STATE TAXES	0.02	0.017	0.023

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