



2015 Safety Report



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Prepared by
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Table of Contents

<i>Chapter</i>	<i>Page</i>
List of Figures	v
List of Tables	vii
1. Introduction	1
1.1 Background	1
1.2 Survey Instrument	2
1.3 Reading Reported Rates	3
1.4 Key Findings	3
1.5 Limitations	4
2. Summary of Aggregated Data	5
3. Industrial Sector Analyses	13
4. Project Location Analysis	21
5. Duration of DA and RT Cases	29
6. Near Misses and First Aid Cases	35
7. Fatalities	39
8. Corporate Safety Benchmarks	43
9. Note on Work Type Analysis	49
10. Conclusions	51
11. References	53
Appendix A: Definitions	55
Appendix B: Industry Division of CII Safety Survey	57

List of Figures

Figure 1. Inputs for the CII Annual Safety Survey Instrument	2
Figure 2. TRIR (RIR) Rate, Aggregated Data, 1989–2014	8
Figure 3. DART (LWCIR) Rate, Aggregated Data, 1989–2014	9
Figure 4. Control Charts of Safety Rates from 2005–2014	11
Figure 5. Safety Trends of CII Members Participating in the Annual Safety for 2009–2014 and Other CII Members	12
Figure 6. TRIR Rate by Industry Group	14
Figure 7. DART Rate by Industry Group	15
Figure 8. Owner TRIR Three-year Moving Average, 2001–2014	17
Figure 9. Contractor TRIR Three-year Moving Average, 2001–2014	17
Figure 10. Owner DART Rate Three-year Moving Average, 2001–2014	18
Figure 11. Contractor DART Rate Three-year Moving Average, 2001–2014	18
Figure 12. TRIR Rates for U.S.-based and International Projects	22
Figure 13. DART Rates for U.S.-based and International Projects	23
Figure 14. U.S. TRIR Rate by Industry Group	24
Figure 15. U.S. DART Rate by Industry Group	25
Figure 16. International TRIR Rate by Industry Group	26
Figure 17. International DART Rate by Industry Group	27
Figure 18. Average Duration of DA Cases	30
Figure 19. Average Duration of RT Cases	31
Figure 20. Average Duration of DA Cases by Industry Group	32
Figure 21. Average Duration of RT Cases by Industry Group	33
Figure 22. Near Miss Tracking	36
Figure 23. First Aid Tracking	37

Figure 24. TRIR Rate and First Aid Tracking	38
Figure 25. DART Rate and First Aid Tracking	38
Figure 26. Fatality Rate by Respondent Type since 1999	40
Figure 27. Three-year Fatality Rate Moving Average by Respondent Type	40
Figure 28. Fatal Occupational Injuries among CII Members That Reported in 2014 (2013 Calendar Year Data) by Cause, 2012–2014	41
Figure 29. 2014 Corporate Safety Statistics – TRIR Rate of U.S. Projects	46
Figure 30. 2014 Corporate Safety Statistics – DART Rate of U.S. Projects	47
Figure 31. 2014 Corporate Safety Statistics – DA Rate of U.S. Projects	48
Figure 32. Percent of Work Hours by Work Type for Both Owners and Contractors (78 Companies) in 2014	49
Figure 33. Distribution of TRIR Rates for 37 Contractors Divided into Different Groups by Percentage of Field Work Hours	50

List of Tables

Table 1. 2014 Aggregated Safety Data	5
Table 2. Work Hours by Project and Company Location	6
Table 3. Incident Rates and Changes from 2013 to 2014	7
Table 4. Safety Performance by Employee Type and Industry Group	19
Table 5. 2014 Corporate Safety Benchmarks of All Projects	44
Table 6. 2014 Corporate Safety Benchmarks of U.S. Projects	45

Introduction

This report summarizes the responses of CII members to the 2015 Construction Industry Institute (CII) Annual Safety Survey. The survey was administered to all CII members between April and July in 2015. From among CII's membership of more than 140 organizations, 78 (i.e., 37 owners and 41 contractors) submitted their corporate safety statistics for the 2014 calendar year. These data represented a combined total of 3.19 billion work hours. This report presents the latest safety trends among CII members, and provides corporate safety performance benchmarks that members can use for self-analysis.

The primary purpose of this report is to document the descriptive statistics obtained from the 2015 CII Annual Safety Survey. For the past few years, CII has chosen to limit the amount of commentary regarding potential causes for specific safety statistics or trends. The reasons behind many of the observations are left both for the reader to ponder and for CII to consider for further potential research.

1.1 Background

CII and its members have a long history of valuing safety and being committed to the goal of zero accidents. Reflecting this commitment, CII has funded many safety studies since its founding in 1983. These studies have generated many of the safety practices that CII members and the architectural/engineering/construction (AEC) industry widely use today to deliver capital projects safely. As a part of CII's safety research effort, the CII Performance Assessment Program has collected annual corporate safety performance information from its member organizations since 1990 (for calendar year 1989 data).

1.2 Survey Instrument

The content, formatting, and deployment of the CII Annual Safety Survey have evolved over time to reflect changes in U.S. Occupational Safety and Health Administration (OSHA) reporting standards and to improve data integrity. CII has kept most of the survey questions consistent over time in order to establish safety trends. The latest survey was administered through an online survey instrument, which gathers the data by industry sector, location, and employee type. (See Figure 1.) The main data entry fields collected in the 2015 CII Safety Survey were the following:

- Total Work Hours
- Total Recordable Incident Cases
- Days Away and Restricted or Transferred (DART) Cases
- Days Away (DA) Cases
- Total Number of Days Associated with Days Away (DA) Cases
- Total Number of Days Associated with Job Restriction or Transfer (RT) Cases
- Number of Fatalities.

Work Type	Workhours	Total Number of Recordable Cases	Total Number of Cases with Days Away from Work	Total Accumulated Number of Days Away from Work	Total Number of Cases with Job Transfer or Restriction	Total Accumulated Number of Days of Job Transfer or Restriction	Total Number of Fatalities
Home Office							
Field							
Home Office							
Field							

Figure 1. Inputs for the CII Annual Safety Survey Instrument

The CII Safety Survey focuses on safety data associated with capital projects, excluding operations and maintenance. In addition, the survey includes questions regarding near misses, first aid cases, and fatalities. A copy of the 2015 CII Annual Safety Survey is available from CII upon request. CII aligns all safety terms used in the survey with OSHA definitions, in order to compare the survey results with the yearly safety statistics that OSHA provides on the overall U.S. construction industry. Appendix A provides definitions of the key terms used throughout this report.

1.3 Reading Reported Rates

The reader should note that, throughout this report, smaller values of safety rates are considered better than higher values. If a rate increased since the previous report, the safety rate is said to have worsened. Otherwise, if a rate decreased since the previous report, it is said to have improved. These qualifications of rates as higher/worse or better/lower used interchangeably throughout this report. Similarly, a given group (e.g., heavy industrial projects) is said to outperform other groups when its rates are lower than the rates of other groups.

1.4 Key Findings

This year, the survey generated nine key findings:

1. As a group, CII members continued to outperform the U.S. construction industry by a substantial margin.
2. Companies reporting safety data in more than five subsequent years are still presenting better safety rates relative to other CII organizations. (See Figure 5.)
3. Contractors in the heavy industrial sector still presented the best contractor rates. Owners in the building sector experienced the best owner rates, followed by owners in the heavy industrial sector. (See Figures 6 and 7.)
4. Owner-reported data showed that the infrastructure sector experienced the worst (three-year average) DART and TRIR rates, and that the heavy industrial sector had the best rates.
5. Overall, U.S. safety rates are still worse than international rates. (See Figures 12 and 13.)
6. The heavy industrial sector data presented the best rates for both U.S. and international projects, for both owners and contractors. (See Figures 14 through 17.)
7. Both owner- and contractor-reported data from U.S. projects indicated higher average RT duration, compared to rates calculated from the international data. (See Figures 19.)
8. As in the past, most owners and contractors reported that they were tracking first aid incidents and near misses. (See

Figures 22 and 23.) Contractors tracking first aid incidents continued to present better safety rates. However, in 2014, owners tracking first aid incidents experienced worse TRIR and DART rates. (See Figures 24 and 25.)

9. Among CII members, fatality cases increased substantially from 16 fatalities in 2013 to 31 in 2014. (See Figure 28.) “Falls” and “Contact with objects and equipment” were among the major causes of fatalities. OSHA fatality cases increased from 796 to 874 fatalities, and the construction industry fatality rate increased from 9.4 to 9.5 cases per 100,000 full-time workers in 2014.
10. Data still indicate that the goal of zero accidents can be achieved. In fact, seven CII members reported zero safety incidents across their organizations in 2014.

1.5. Limitations

As with previous annual safety surveys, CII owner and contractor members were asked to provide safety data for both their direct-hire employees and their contractors’ employees. However, because contractors were not uniquely identified in the owner responses, some double reporting of contractor data is likely. This overlap often presents itself in two ways:

- owners reporting on their contractors’ employees
- contractors reporting on their direct-hire employees.

In addition, the results for the building and infrastructure sectors may not be fully representative, due to small sample sizes. Consequently, readers should use caution when comparing results across sectors. With more and more CII members participating in the survey, and with CII continually expanding into the building and infrastructure sectors, these issues will likely become less prevalent in the future.

2

Summary of Aggregated Data

This chapter presents the results of the aggregated data analyses for the 2015 CII Annual Safety Survey. Table 1 summarizes the aggregated 2014 safety data obtained through the survey. The total cumulative work hours increased 10 percent from 2013 to 2014, and included 78 participating members (compared to 76 in the previous report). Table 1 also presents the aggregated data by respondent type (i.e., owner and contractor). Unlike in previous years, contractors reported less than half of the total work hours, with a decrease from 61 percent of the total work hours in 2013 to 48 percent in 2014.

Table 1. 2014 Aggregated Safety Data

	Contractors	Owners	Total
Total Number of Recordable Cases	3,105	3,601	6,706
Total Work Hours	1,655,763,300	1,542,066,519	3,197,829,820
Total Number of DART Cases	1,225	1,029	2,254
Total Work Hours	1,655,763,300	1,316,918,660	2,972,681,961
Total Number of DA Cases	426	285	711
Total Work Hours	1,631,267,310	668,605,632	2,299,872,943
Total Number of Fatalities	17	11	28
Total Work Hours	1,655,763,300	1,542,066,519	3,197,829,820

The reader should note that some responding members could not provide all of the requested data or give details by category. (CII staff members prepare the final data set for this report each year, after considerable effort to validate the data.) For this reason, the total overall work hours reported differ for many of the metrics presented in Table 1 (e.g., work hours for contractors' DART and recordable cases). In particular, some owners had difficulty reporting information related

to job restriction or transfer (RT) cases due to the short durations of the work tasks involved. As a result, data shown in Table 1 have been adjusted to reflect the most conservative basis (where necessary), due to missing data uncovered during validation.

In 2014, approximately 70 percent of the reported work hours were obtained from international projects. Table 2 presents the reported work hours by project location and the location of the company that reported the data.

Table 2. Work Hours by Project and Company Location

Project Location	Domestic Company* Million Work Hours (MM WH)	International Company Million Work Hours (MM WH)	Total
International	1,162.88 (36%)	1,048.46 (33%)	2,211.34 (70%)
U.S.	770.74 (24%)	3.82 (0.1%)	774.56 (24%)
No Location	211.93 (6.6%)	N/A	211.93 (6.6%)
Grand Total	2,145.55 (67%)	1,048.46 (33%)	3,197.83 (100%)

* Domestic company refers to companies that reported data from U.S. (even if the company's headquarters is abroad).

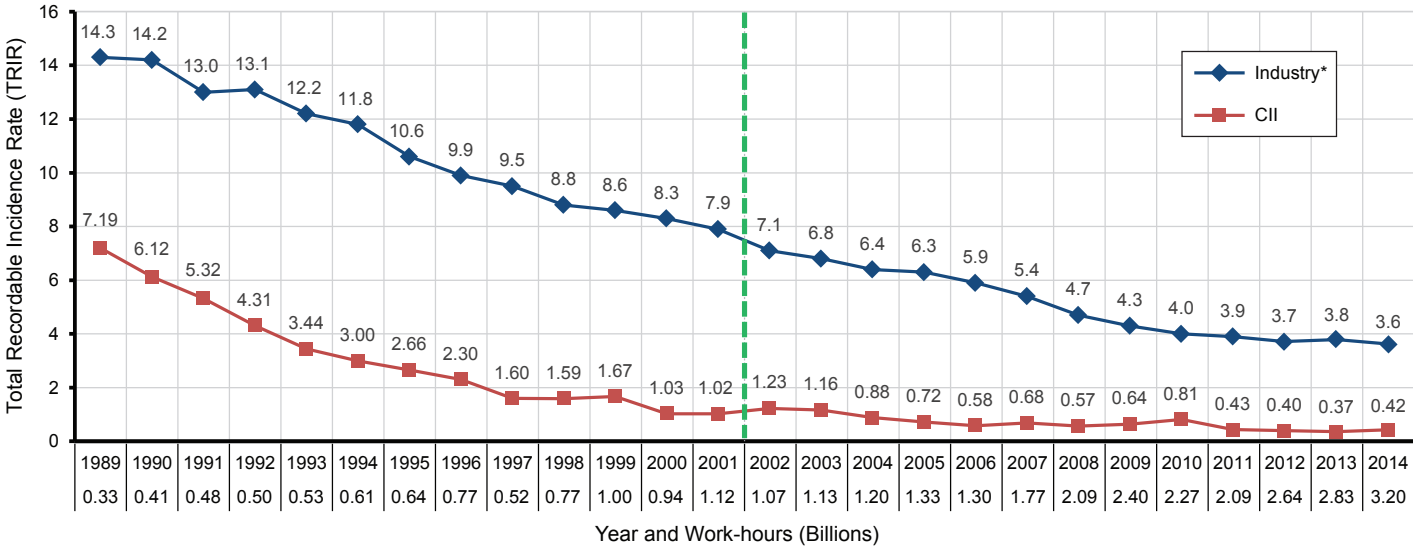
Table 3 compares the safety rates from the past two years. As a group, CII members' TRIR worsened by 12 percent from 2013 to 2014. When segmented by respondent, the data show that CII owner members experienced a 23-percent increase in their TRIR, while the rate increased by 1.4 percent for contractors. The overall DART rate did not change from 2013 to 2014; however, the owners' rate experienced a 51-percent increase, while the contractors' rate decreased by 12 percent. The overall fatality rate increased substantially (i.e., by 58 percent). When examining the fatality rate by respondent, CII found that contractors had an 83-percent increase in their collective fatality rate, while owners' fatality rates increased by 31 percent.

Table 3. Incident Rates and Changes from 2013 to 2014

Respondents	Metric	2013	2014	Change
All	TRIR	0.374	0.42	12.1%
	DART Rate	0.152	0.15	−0.2%
	DA Rate	0.084	0.06	−26.4%
	Fatalities	1.11	1.75	57.8%
Owners	TRIR	0.379	0.47	23.2%
	DART Rate	0.103	0.16	51.7%
	DA Rate	0.099	0.09	−13.9%
	Fatalities	1.092	1.43	30.6%
Contractors	TRIR	0.37	0.38	1.4%
	DART Rate	0.168	0.15	−11.9%
	DA Rate	0.075	0.05	−30.4%
	Fatalities	1.12	2.05	83.3%

To obtain the results presented in this report, CII calculates the DART, TRIR, and fatality rates consistent with OSHA definitions. This means that the data shown for DART and TRIR note the number of cases or recordable injuries (respectively) for 100 workers working 40 hours a week for 50 weeks each year (i.e., 2,000 hours per worker per year). The calculations are different for the fatality rate, which is determined by the number of fatalities occurring among 100,000 workers working for a full year.

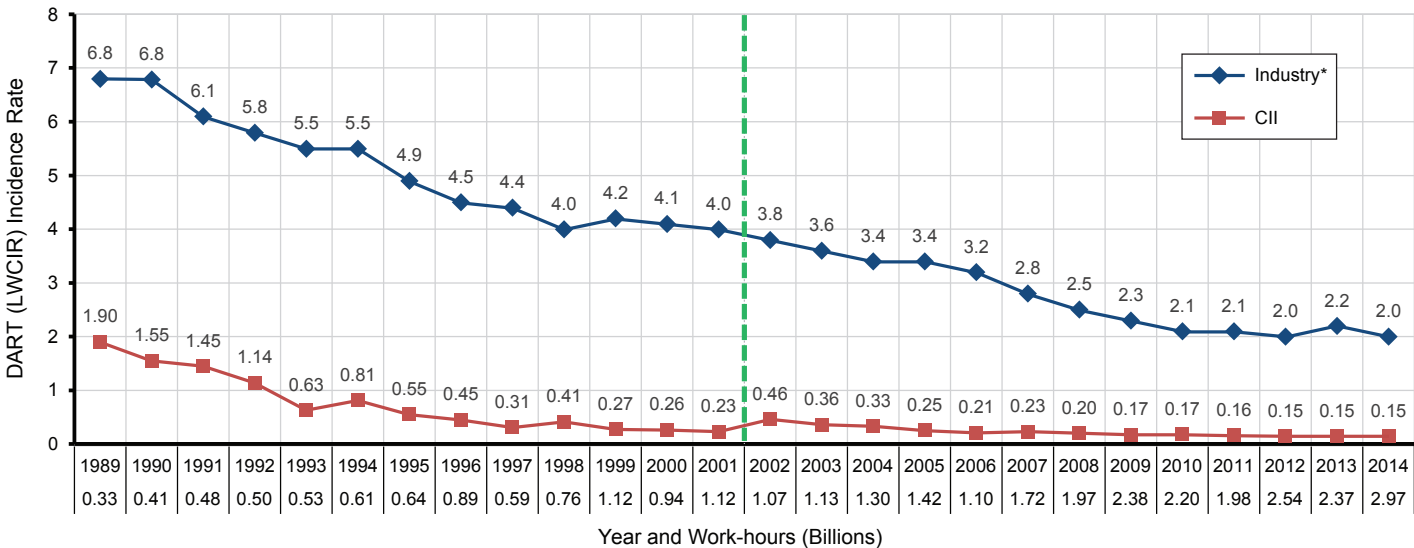
Figures 2 and 3 display the trends of TRIR (known as RIR prior to 2002) and DART (called LWCIR prior to 2002) rates for CII members and for the U.S. construction industry from 1989 to 2014. CII members continue to surpass the U.S. construction industry in safety by a significant margin. That said, in the past few years, the differences in safety rates have narrowed between CII members and the U.S. industry at large. In 2014, the U.S. construction industry has continued to progress with regard to safety performance in terms of TRIR rate, but the overall TRIR rate for CII members has worsened.



*OSHA Construction Division, NAICS 236–238 (SIC 15-17)

--- Reflects OSHA reporting change

Figure 2. TRIR (RIR) Rate, Aggregated Data, 1989–2014



*OSHA Construction Division, NAICS 236–238 (SIC 15-17)

--- Reflects OSHA reporting change

Figure 3. DART (LWCIR) Rate, Aggregated Data, 1989–2014

When OSHA changed its record-keeping rules on January 1, 2002, it altered some of the criteria that determine which injuries and illnesses are recorded. As a result, OSHA suggests that readers should use reasonable caution when comparing data produced under previous regulations with data produced under the new rules. Consequently, since 2003, the CII Annual Safety Report has distinguished the safety data collected before and after the record-keeping rule changes, wherever necessary. For example, in Figures 2 and 3, a dashed green line marks the 2002 OSHA rule changes.

In order to understand the significance of the relatively stable safety performance of CII members in the last few years, CII created control charts that present the most recent 10 years' TRIR and DART rates. (See Figure 4.) The charts indicate that the process appears to be under control as defined by statistical process control (SPC) methods (i.e., all points fall inside the control limits). As Figure 4 illustrates, if all CII members continue to manage safety as they now do, they may never achieve the goal of zero accidents. Indeed, some fundamental changes are warranted to move the construction industry toward the goal of zero accidents. In order to address such needs, CII has funded a research project that focuses on using precursor analysis to prevent low-frequency high-impact events, including fatalities (Research Team 321).

Further, when CII looked at the 15 organizations that have submitted safety data each year for the past five years, their TRIR rate has been trending upward whereas their DART rate has trended slightly downward. (See Figure 5.) As in previous years, the companies that submitted safety data each year for the past five years experienced better TRIR and DART rates compared to the rest of the companies reporting data in 2014.

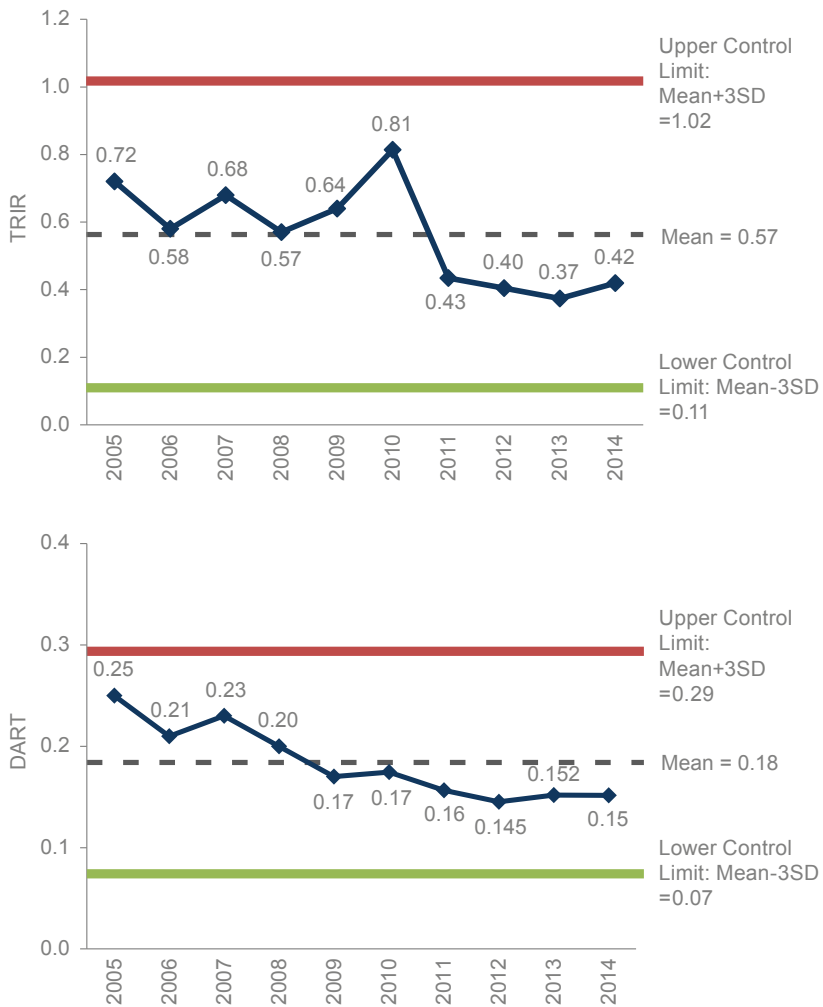


Figure 4. Control Charts of Safety Rates from 2005–2014

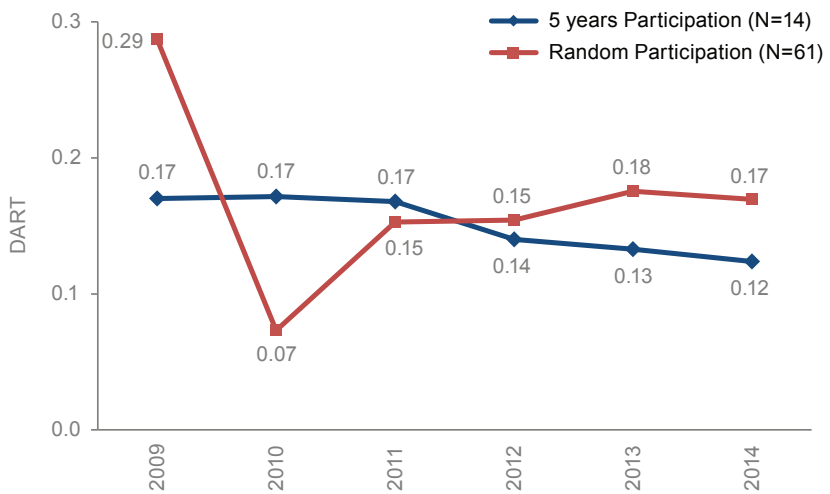
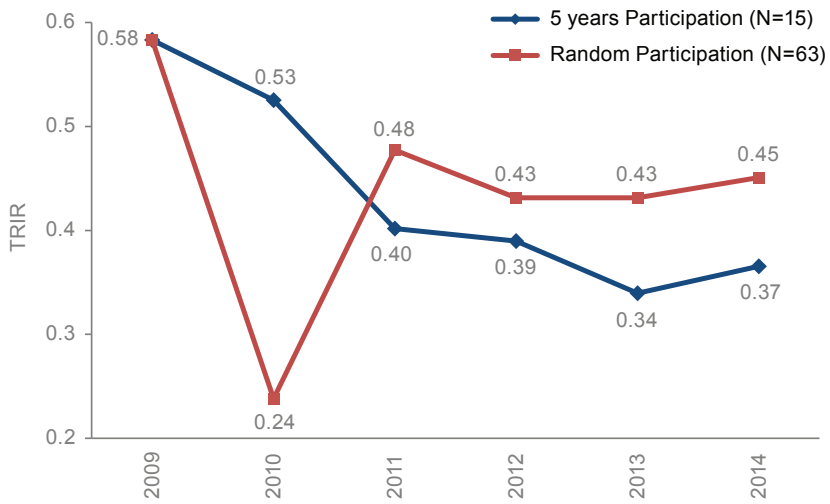


Figure 5. Safety Trends of CII Members Participating in the Annual Safety for 2009–2014 and Other CII Members