Guidehouse

To:	Peoples Gas and North Shore Gas, Elizabeth Horne, David Brightwell, ICC Staff
CC:	Laura Agapay-Read, Jeff Erickson, Guidehouse
From:	Steph Grisell, Celina Aguilar, Guidehouse; Theresa Wells, George Frymire, Mike Frischmann, EcoMetric
Date:	Aug 27, 2025
Re:	Peoples Gas and North Shore Gas Multi-Family Property Manager & Trade Ally Free Ridership and Spillover Survey Results

1. Executive Summary

This memo presents findings from the net-to-gross (NTG) study of the Peoples Gas and North Shore Gas (PGL/NSG) Multi-Family Program. The participant free ridership (FR) results for this program are estimated according to the FR core non-residential methodology specified in the Illinois Technical Resource Manual (TRM). The team gathered FR and spillover (SO) information via online surveys to two populations: 1) participating multi-family property managers[1] to assess the impact of the program on the customer's decision to pursue energy efficient upgrades, and 2) active trade allies[2] to assess the program impact on the contractor's decision to recommend and sell energy efficient equipment. From 2023 through 2025, Guidehouse surveyed program participants from program years 2022-4 for FR. In 2023, Guidehouse surveyed program participants from program year 2022 for SO. We also surveyed trade ally FR and SO in 2023, reporting SO that fall.[3]

Table 1 summarizes the Multi-Family Program[4] FR and SO research findings based on the participant and trade ally research. The NTG ratio of 0.99 for all measures is a blended value of the participant and trade ally NTG results.

Table 1. Net-to-Gross Research Results for Multi-family Program

Population	Free Ridership	Spillover	NTG Ratio
Participant (all paths)	0.17	0.03	
Trade Ally	0.03	0.01	
Combined Results	**0.05**	**0.04**	**0.99**

Note: Numbers may not sum due to rounding. The combined result is not a straight average as explained in section 4.2.
Source: Evaluation team analysis

[1] The studies surveyed the owners or managers of multi-family properties who made the decision to participate in the program, and the memo refers to both as "participants."

[2] In this memo we use the term "trade ally" to refer to the contractors who help deliver the program to residential customers.

[3] https://www.ilsag.info/wp-content/uploads/PGL-NSG-Multifamily-Partner-Trade-Ally-Spillover-Memo-2023-08-30-Final.pdf

[4] Sample size was not large enough to support program path-specific results.

167 North Green Street
12th floor | Chicago, IL 60607
guidehouse.com

2. Free Ridership and Spillover Research Sample Disposition

Guidehouse fielded the participant and trade ally online surveys using Qualtrics web survey software. The team emailed survey invitations to multi-family participants who bought program incentivized measures between January 2022 through December 2024 and trade allies who sold program incentivized measures in 2022. After the initial survey invitation email, the team emailed two additional reminders to encourage completion of the survey. Guidehouse offered a $75 Tango e-gift card to qualified participants who completed the FR survey and a $30 Tango e-gift card for those who completed the SO survey. Qualified trade allies who completed the survey, which contained both FR and SO question batteries, were offered a $50 Tango e-gift card. Table 2 presents the population and sampled participant counts and savings.

Table 2. Participant and Trade Ally Free Ridership Survey Sampling and Targets

Population	Total Population of Unique Participants	Total Population Savings (therms)	Number of Participants Sampled	Total Sampled Savings (therms)	Target Completes
2022-2024 Participants	561	2,878,308	162	1,449,970	75
2022 Trade Allies	9	954,679	9	954,679	9

Source: Evaluation team analysis

A total of 36 participant free ridership surveys were completed. Six surveys had to be excluded from the analysis due to responses of "don't know" to key free ridership questions used in the calculations. All 8 of the completed trade ally surveys were included in the FR analysis. Table 3 presents the number of online surveys completed and analyzed.

Table 3. Participant and Trade Ally Free Ridership Survey Response

Population	Actual Completes	Analysed Completes	Response Rate	Percent of Program Savings Represented
2022-2024 Participants	36	30	19%	1%
2022 Trade Allies	8	8	89%	90%

Source: Evaluation team analysis

A total of 38 participants completed the spillover survey, of which 21 indicated they completed additional efficiency improvements, and nine resulted in qualified spillover. Two of the eight trade allies who completed the survey indicated they sold additional equipment, and both resulted in qualified spillover.

Table 4. Participant and Trade Ally Spillover Survey Fielding Disposition

Category	Sample of Unique Participants	Target Completes	Actual Completes	Additional Efficiency Improvements	Qualified for Spillover
Participants	285	43	38	21	9
Trade Allies	9	30	8	2	2

Source: Evaluation team analysis

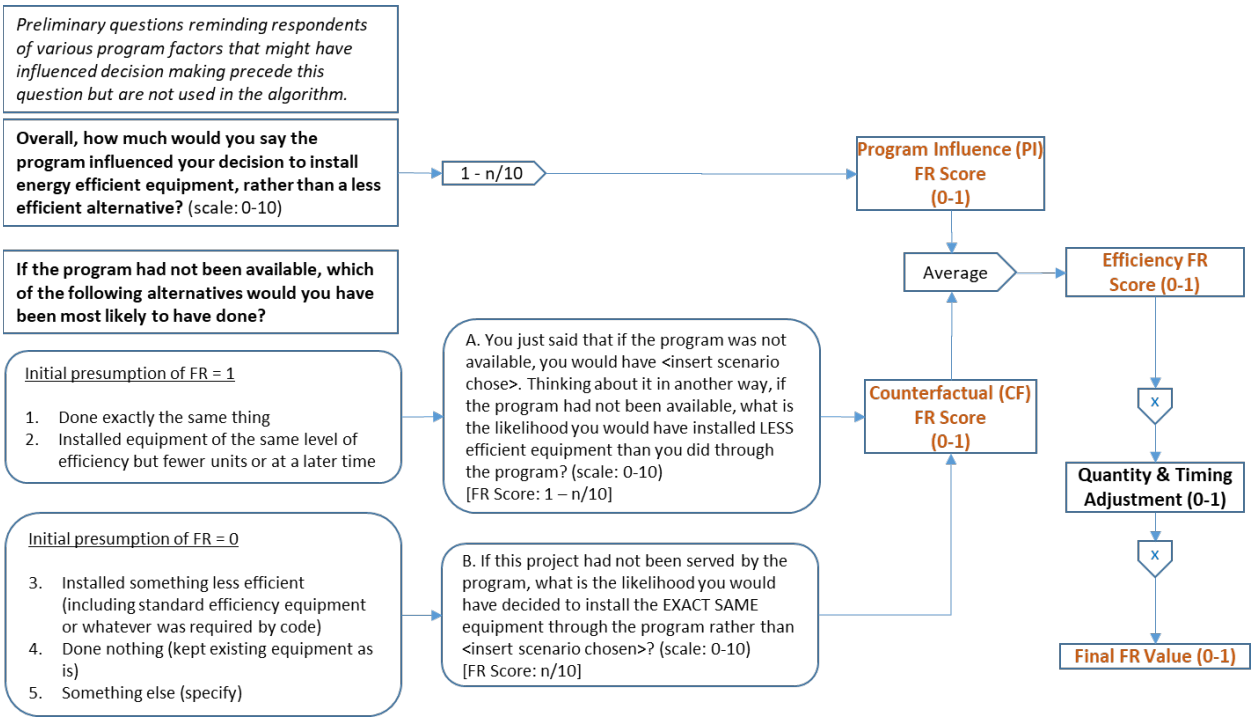
3. Free Ridership and Spillover Protocols

This section presents the free ridership and spillover protocols used.

3.1 Participant Free Ridership Estimation

Figure 1 describes the participant free ridership algorithm used to calculate FR for the Multi-Family Participant surveys.

Figure 1. Multi-Family Participant Free Ridership Algorithm

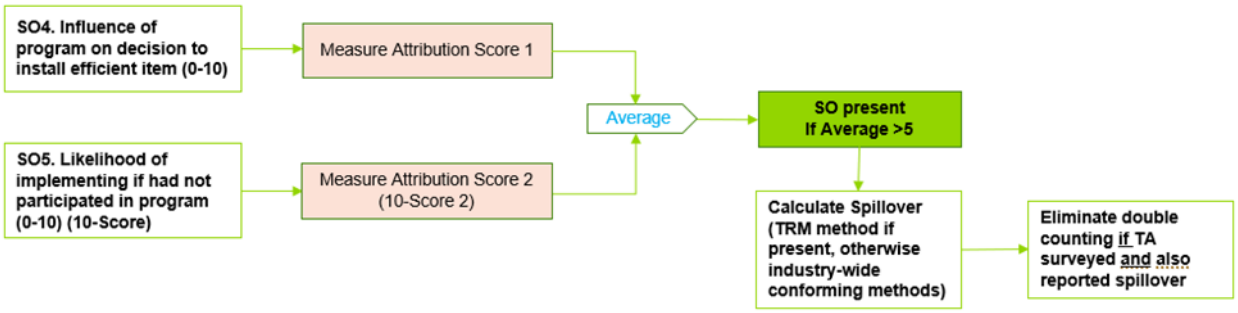


Source: 2024 Illinois TRM Version 12.0 – Compiled Version (page 1625)

3.2 Participant Spillover Estimation

Guidehouse calculated participant spillover based on the 2024 Illinois TRM Volume 13, Sections 3.1.2 and 3.1.3, summarized in Figure 2.

Figure 2. Multi-Family Participant Spillover Algorithm

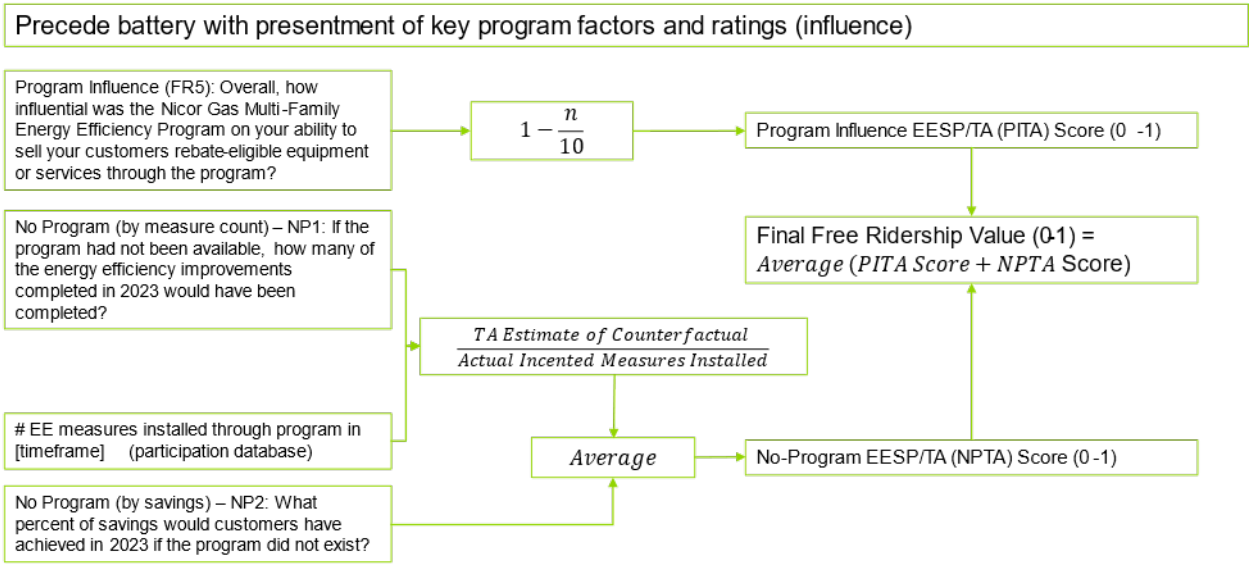


Source: Algorithm based on the content from the 2024 Illinois TRM Volume 12.0, Sections 3.1.2 and 3.1.3

3.3 Trade Ally Free Ridership Estimation

The IL TRM does not specify an approach for measuring the trade ally perspective of participant FR. For this study, Guidehouse used the following method to assess participant FR from a trade ally perspective. This methodology is summarized in Figure 3 below.

Figure 3. Trade Ally Free Ridership Algorithm



Source: Guidehouse

4. Participant and Trade Ally Free Ridership Results

Using the protocols detailed above and data collected during the participant and trade ally surveys, Guidehouse calculated FR estimates for the program participants and trade allies. Table 5 below presents their relative precision.[5] Section 4.2 details the process of combining participant and trade ally FR estimates.

[5] The analysis estimates relative precision at the 90 percent confidence level by calculating the standard error of the NTGR mean and adjusting for the total population size.

Table 5. Participant and Trade Ally Free Ridership Research Results

Population	Free Ridership	Relative Precision @90% CI
Participant	0.17	6.06%
Trade Ally	0.03	0.16%

Source: Evaluation Team Analysis

4.1 Free Ridership Consistency Check Analysis

The evaluation team checked for consistency in free rider responses by asking respondents to describe in their own words any influence that the program had on their decision to participate in the program, or what they would have done if the program, and its technical assistance and financial incentives, did not exist (see Figure 1).

The evaluation team found no inconsistencies in the verbatim responses for the participant FR and did not adjust scores for that calculation.

4.2 Combining Participant and Trade Ally Free Ridership

Guidehouse calculated a combined participant and trade ally FR estimate utilizing the triangulation approach outlined in the IL TRM version 13 (Section 5.1 Volume 4). This approach rates the participant and trade ally survey data on three aspects: accuracy, validity, and representativeness, using a scale where 100% means "extremely so" and 0% means "not at all."

1. Accuracy: How likely is the approach to provide an accurate estimate of FR?
    a. We calculated the participant and trade ally portions based on a comparison of their relative precision (RP) values from the FR estimates.
    b. For this program, the RP from the participant surveys (0.061) was substantially greater than that of the trade ally surveys (0.002), indicating that the trade ally result was more precise. To base our Accuracy score on RP, we normalized and inverted the result using the equation below. This resulted in a weight of 3% for the participant data and 97% for the trade ally data.

$$Normalized\ Weight = 1 - \left(\frac{Participant\ or\ Trade\ Ally\ RP}{Participant\ RP + Trade\ Ally\ RP}\right)$$

2. Validity: How valid are the data collected and the analysis? The evaluation team averaged quantitative and qualitative scoring for Validity.
    a. The quantitative score for participants and trade allies was based on the number of complete interviews relative to their total population. A total of 30 of the 561 participants completed surveys, resulting in a normalized score of 6% (refer to the formula below). In comparison, 8 out of 9 trade allies completed surveys, yielding a normalized score of 94%.

$$Normalized\ \%\ Weight = \frac{\%\ Complete\ for\ Participant\ or\ TradeAlly}{(\%\ Complete_{Participant} + \%\ Complete_{TradeAlly})}$$

b. The qualitative score reflects the nature of the surveys. Participant surveys ask project-specific questions and, thus, are likely to have lower recall bias. In contrast, trade ally surveys cover multiple projects over the year, thus we rate trade ally validity at 40% and participant validity at 60%.
c. By averaging the quantitative and qualitative scores, the final Validity scores are 33% for participants and 67% for trade allies.

3. Representativeness: How representative is the sample?
We assigned 1% weight to the participant portion and 99% weight to the trade ally portion, which is the normalized percentage of program savings represented by survey respondents.

Table 6. Free Ridership Triangulation Weighting Approach

Free Ridership Triangulation Data and Analysis	Participant	Trade Ally
How likely is this approach to provide an accurate estimate of free ridership?	3%	97%
How valid is the data collected/analysis?	33%	67%
How representative is the sample?	1%	99%
Average Score (Weight)	**12%**	**88%**

Source: Evaluation Team analysis

Applying these participant and trade ally weights to the FR estimates yields the blended FR estimates shown in the equation below.

$$\begin{aligned} Free\ Ridership &= (Participant\ FR) * (Participant\ Weight) + (Trade\ Ally\ FR) \\ &* (Trade\ Ally\ Weight) \\ &= 0.17 * 0.12 + 0.03 * 0.88 \\ &= 0.05 \end{aligned}$$

The evaluation team used this formula to combine the (0.17) participant free ridership with the (0.03) service provider free ridership to produce the combined weighted free ridership of 0.05.

5. Participant and Trade Ally Spillover Results

Of the 38 participant survey respondents included in the participant spillover analysis, 21 reported that they had installed additional energy efficient measures. Of those 21 responses, 10 indicated they had not received program incentives. Nine participants passed the spillover attribution screening criteria, and the evaluation team estimated gross energy savings from these non-rebated spillover measures at 7,140 therms. The gross energy savings of the 38 participants who responded to the survey were 216,533 therms, which resulted in a participant spillover rate of 3.3%.

Of the 8 trade allies included in the trade ally analysis, two reported selling additional non-program incented high efficiency lighting measures, and both passed all the spillover attribution screening criteria. The estimated gross energy savings from these non-rebated spillover measures was 10,017 therms. The gross energy savings of the eight trade allies who responded to the survey were 992,148 therms, which resulted in a trade ally spillover rate of 1.0%.

To ensure that spillover from the participant and trade ally sources did not lead to double counting, the evaluation team examined the data to exclude any reported spillover transactions from participants who purchased their measure from a trade ally who reported spillover. We found only one participant who qualified for spillover and was a customer of a qualified trade ally spillover respondent; that participant's spillover savings was removed from the participant spillover rate calculation (and doing so did not change the participant spillover rate).

Table 7 presents the participant and trade ally spillover results, as well as the total spillover calculated, which is the sum of those results.

Table 7. Spillover Research Results

Population	Spillover Results
Participant Spillover	0.03
Trade Ally Spillover	0.01
Total Spillover	**0.04**

Source: Evaluation Team Analysis

6. Final NTG Results and Recommendations

The final NTG value is calculated as 1- free ridership + spillover, using averaged values from participants and savings weighted values from trade allies using the following formula:

$$NTG = 1 - [(Participant\ FR * Participant\ Weight) + (Trade\ Ally\ FR * Trade\ Ally\ Weight)] + Participant\ Spillover + Trade\ Ally\ Spillover$$

The final combined components of the NTG are shown in Table 8.

Table 8. Summary of Free Ridership, Spillover, and NTG Results

Program	Free Ridership	Spillover	NTG Ratio
Multi-family (all paths)	**0.05**	**0.04**	**0.99**

* Numbers may not sum due to rounding.
Source: Evaluation team analysis

7. Multi-Family NTG History

GPY1	**Direct Install Program NTG**: 0.90 **Free ridership** 0.10 **Spillover 0.00** **Method and Source**: Evaluation research consisting of participating GPY1 customer self-reports (tenants and property decision-makers). NTG based on CATI telephone survey with participating decision-makers (21 property managers for Peoples Gas and North Shore Gas interviewed from a GPY1 population of 343). Program was delivered an assessment and direct installation offering.
GPY2	**Peoples Gas: Deemed NTG** 0.90; **Free ridership** 0.10; **Participant Spillover:** 0.00 **North Shore Gas: Deemed NTG** 0.90; **Free ridership** 0.10; **Participant Spillover:** 0.00 **Method and Source**: Deemed by SAG consensus from GPY1 evaluation research.
GPY3	**Peoples Gas: Deemed NTG** 0.90; **Free ridership** 0.10; **Participant Spillover:** 0.00 **North Shore Gas: Deemed NTG** 0.90; **Free ridership** 0.10; **Participant Spillover:** 0.00 **Method and Source**: Deemed by SAG consensus from GPY1 evaluation research.
GPY4	**Peoples Gas and North Shore Gas:** **In-Unit Direct Installation: NTG** 0.90; **Free ridership** 0.10; **Spillover:** 0.00 **Method and Source**: No new research. Value from GPY1 evaluation research. **Prescriptive Rebates: NTG** 0.84 (PGL); 0.90 (NSG) **Method and Source**: Based on a weighting of the C&I Prescriptive GPY4 NTG value (0.58) and Multifamily DI NTG (0.90) to reflect decision-makers, measure types, and decision scenario indicated by rate classification. **TAPI Incentives: NTG 0.99** **Method and Source**: Based on GPY1 evaluation research of the joint utility Small Business Energy Savings Program. **Custom Incentives: NTG 0.68** **Method and Source**: Based on the C&I Custom Rebate Program GPY4 NTG value. **Gas Optimization: NTG 1.02** **Method and Source**: Based on GPY1 evaluation research of the joint utility Retro-Commissioning Program.
GPY5	**In-Unit Direct Installation: NTG** 0.92; **Free ridership** 0.10; **Spillover:** 0.02 **Method and Source**: Free-ridership value from GPY4. Spillover value from PGL/NSG CATI telephone survey with participating GPY3 decision-makers (74 property managers). **Prescriptive Rebates: NTG** 0.87 (PGL); 0.92 (NSG) **Method and Source**: Based on a weighting of the C&I Prescriptive GPY5 NTG value (0.63) and Multifamily DI NTG (0.92) to reflect decision-makers, measure types, and decision scenario indicated by rate classification. **TAPI Incentives: NTG 0.99** **Method and Source**: No new research. Value from GPY4.

	Custom Incentives: NTG 0.78 **Method and Source**: Based on the C&I Custom Rebate Program GPY5 NTG value. **Gas Optimization: NTG 1.02** **Method and Source**: No new research. Value from GPY4.
GPY6	**In-Unit Direct Installation: NTG** 0.92; **Free ridership** 0.10; **Spillover:** 0.02 **Method and Source**: Free-ridership value from GPY4. Spillover value from PGL/NSG CATI telephone survey with participating GPY3 decision-makers (74 property managers). Comparable research will be conducted with GPY5 PGL and NSG property owners/managers to update these values. **Prescriptive Rebates and Partner Trade Ally Projects: NTG** 0.92 (PGL); 0.92 (NSG) **Method and Source**: These types of projects have not been directly researched in Multi-Family, so proxy values from other programs have been used and weighted in previous years. When GPY4 NTG research updates in C&I Prescriptive and with Small Business trade allies are applied to the Multi-Family NTG values, the Multi-Family values fall in a range of 0.90 to 0.93. Differences in that range are not significant. We recommend a single value of 0.92 until research is completed with GPY5 PGL and NSG property owners/managers to establish values for these projects and decision makers. **Custom Incentives: NTG 0.78** **Method and Source**: Based on GPY2 custom project research that included multi-family decision-makers. The GPY4 C&I Custom Program NTG research did not include multi-family decision makers. **Gas Optimization: NTG 1.02** **Method and Source**: No new research. Value from GPY4.
GPY7	**In-Unit Direct Installation (except faucet aerators): NTG 0.85; Free ridership 0.18; Participant Spillover: 0.03; Non-Participant Spillover 0.00.** **In-Unit Direct Installation Faucet Aerators: NTG 1.03; Free ridership 0.00; Participant Spillover: 0.03; Non-Participant Spillover 0.00.** **Prescriptive Rebates: NTG 0.76; Free ridership 0.27; Participant Spillover: 0.03; Non-Participant Spillover 0.00.** **Partner Trade Ally Projects: NTG 0.88; Free ridership 0.15; Participant Spillover: 0.03; Non-Participant Spillover 0.00.** **Custom Incentives: NTG 0.72; Free ridership 0.31; Participant Spillover: 0.03; Non-Participant Spillover 0.00.** **Comprehensive Project Roll-up Average: NTG 0.84; Free ridership 0.19; Participant Spillover: 0.03; Non-Participant Spillover 0.00.** **Method**: Free-ridership and Participant Spillover values from GPY5 evaluation research conducted by CATI telephone survey with GPY5 decision-makers (59 property managers or owners). Interviews with 11 trade allies did not find evidence of PSO or NPSO. The GPY5 research applied the TRM v6.0 NTG algorithms. Due to the small population of MF custom projects, the GPY5 Multifamily research completed three Multi-Family Custom interviews, with a FR = 0.31, but did not achieve a 90/10 result. The GPY4 C&I Custom Rebate Program FR estimate was 0.31, and 0.31 is judged to be the best available value. The GPY4

	research used TRM v5.0 NTG algorithms, and GPY5 research used TRM v6.0 NTG algorithms. TRM version 6.0 specifies that the free ridership for faucet aerators be set at zero when estimating gross savings using the TRM specified baseline average water flow rate. The comprehensive roll-up NTG value covers Prescriptive, PTA, and Custom MF participants. The roll-up value may be used instead of the path-level NTGs. **Gas Optimization: NTG 1.02** **Method and Source**: No new research. Retained value from GPY6.
2019 NTG Values	**Assessment/Direct Install (all measures except faucet aerators and showerheads when using TRM specified baseline average water flow rates) NTG: 0.85; Free Ridership: 0.18; Participant Spillover: 0.03** **Method:** FR, PSO, NPSO (PGL & NSG EM&V GPY5; TRM v6.0 algorithms). Participant spillover was not estimated by program path; the 0.03 value represents the overall MF program based on 59 interviews conducted in the GPY5 MF NTG research. Trade ally interviews did not find PSO or NPSO. **Assessment/Direct Install (faucet aerators and showerheads when using TRM specific baseline average water flow rates) NTG:** 1.03 TRM version 7.0 specifies that the free ridership for faucet aerators and showerheads be set at zero when estimating gross savings using the TRM specified baseline average water flow rate. PSO =0.03 based on 59 interviews conducted in the GPY5 MF NTG research. Trade ally interviews did not find PSO or NPSO. **Multi-Family Comprehensive Prescriptive Rebates** **NTG: 0.76; Free Ridership: 0.27; Participant Spillover: 0.03** **Method:** FR, PSO, NPSO (PGL & NSG EM&V GPY5; TRM v6.0 algorithms) **Multi-Family Comprehensive TAPI Incentives/Partner Trade Allies** **NTG: 0.88; Free Ridership 0.15; Participant Spillover: 0.03.** **Method:** FR, PSO, NPSO (PGL & NSG EM&V GPY5; TRM v6.0 algorithms) **Multi-Family Comprehensive Custom Incentives** **NTG; 0.72; Free Ridership: 0.31; Participant Spillover: 0.03.** **Method:** FR (IL EM&V GPY4 for C&I Custom Program and IL EM&V GPY5 for MF Program), PSO, NPSO (PGL & NSG EM&V GPY5 for MF program). GPY4 research used TRM v5.0 algorithms, GPY5 research used TRM v6.0 algorithms. **Multi-Family Comprehensive Roll-up of Prescriptive, PTA, and Custom** **NTG; 0.84; Free Ridership 0.19; Participant Spillover: 0.03** **Method:** FR, PSO, NPSO (PGL & NSG EM&V GPY5; TRM v6.0 algorithms). The roll-up NTG value covers Prescriptive, PTA, and Custom MF participants. The roll-up value may be used instead of the path-level NTGs. **Multi-Family Comprehensive Gas Optimization** **NTG: 0.91; Free Ridership: 0.14; Participant Spillover 0.05** **Method:** FR and PSO: 2018 Survey of 7 GPY6 participants. Memo: Net-to-Gross Research Results from GPY6 for the Gas Optimization Study Offering, Navigant, 8/29/18, revised 9/13/18. The Gas Optimization offering has three paths: building heating, process, and steam plant. Multi-family buildings participate through the building heating path. Multi-Family specific GOS FR and PSO values are preferred if available. The GPY6 population did not have multi-family

	participants, and the two building heating respondents in the sample of seven were not compelling as MF representatives so Navigant used the overall program-level FR and PSO values.
2020 NTG Values	**Direct Install (DI) In-Unit and Common Area (all DI measures except in-unit DI faucet aerators and in-unit DI showerheads) NTG: 0.96; Free Ridership: 0.05; Participant Spillover: 0.01** **Method:** Navigant research with CY2018 participants for FR and GPY6 participants for PSO. The free ridership results meet a 90% confidence interval within 5% precision, based on 15 respondents receiving pipe insulation or programmable thermostats from a population of 95 unique direct installation participants (property owners and managers) from 2018 from Nicor Gas, Peoples Gas, and North Shore Gas, excluding accounts that only installed showerheads and aerators. Participant Spillover from survey of 65 participants from a sample of Nicor Gas, Peoples Gas, and North Shore Gas GPY6 multi-family program participants. **Assessment/Direct Install (faucet aerators and showerheads when using TRM specific baseline average water flow rates) NTG:** 1.03 TRM version 7.0 specifies that the free ridership for faucet aerators and showerheads be set at zero when estimating gross savings using the TRM specified baseline average water flow rate. PSO =0.03 based on 59 interviews conducted in the GPY5 MF NTG research. Trade ally interviews did not find PSO or NPSO. **Direct Install In-Unit Showerheads (when using TRM specified baseline average water flow rates) NTG: 1.01; Free Ridership: 0.0; Participant Spillover: 0.01** **Method:** TRM version 8.0 specifies that the free ridership for showerheads be set at zero when estimating gross savings using the Residential Section of the TRM specified baseline average water flow rate. Participant Spillover from survey of 65 participants from a sample of Nicor Gas, Peoples Gas, and North Shore Gas GPY6 multi-family program participants. **Multi-Family Comprehensive - Path-Based Estimate Prescriptive Rebates NTG: N/A; Free Ridership N/A; Participant Spillover: N/A.** **Method:** Free ridership from Navigant analysis of 23 participant interviews conducted in 2019 of 2018 MF Program participants (C/P 90/9). Sample size not large enough for path-based estimates. NPSO (PGL & NSG EM&V GPY5 for MF program). Participant Spillover from survey of 65 participants from a sample of Nicor Gas, Peoples Gas, and North Shore Gas GPY6 multi-family program participants. **Multi-Family Comprehensive - Path-Based Estimate TAPI Incentives / Partner Trade Allies NTG: N/A; Free Ridership N/A; Participant Spillover: N/A.** **Method:** Free ridership from Navigant analysis of 23 participant interviews conducted in 2019 of 2018 MF Program participants (C/P 90/9). Sample size not large enough for path-based estimates. NPSO (PGL & NSG EM&V GPY5 for MF program). Participant Spillover from survey of 65 participants from a sample of Nicor Gas, Peoples Gas, and North Shore Gas GPY6 multi-family program participants.

	Multi-Family Comprehensive - Path-Based Estimate Custom Incentives NTG: N/A; Free Ridership N/A; Participant Spillover: N/A. **Method:** Free ridership from Navigant analysis of 23 participant interviews conducted in 2019 of 2018 MF Program participants (C/P 90/9). Sample size not large enough for path-based estimates. NPSO (PGL & NSG EM&V GPY5 for MF program). Participant Spillover from survey of 65 participants from a sample of Nicor Gas, Peoples Gas, and North Shore Gas GPY6 multi-family program participants. **Multi-Family Comprehensive Roll-up of Prescriptive, PTA, and Custom NTG; 0.87; Free Ridership: 0.14; Participant Spillover: 0.01.** **Method:** Free ridership from Navigant analysis of 23 participant interviews conducted in 2019 of 2018 MF Program participants (C/P 90/9). Sample size not large enough for path-based estimates. NPSO (PGL & NSG EM&V GPY5 for MF program). Participant Spillover from survey of 65 participants from a sample of Nicor Gas, Peoples Gas, and North Shore Gas GPY6 multi-family program participants. **Multi-Family Comprehensive Gas Optimization NTG: 0.91; Free Ridership: 0.14; Participant Spillover 0.05** **Method:** FR and PSO: 2018 Survey of 7 GPY6 participants. Memo: Net-to-Gross Research Results from GPY6 for the Gas Optimization Study Offering, Navigant, 8/29/18, revised 9/13/18. The Gas Optimization offering has three paths: building heating, process, and steam plant. Multi-family buildings participate through the building heating path. Multi-Family specific GOS FR and PSO values are preferred if available. The GPY6 population did not have multi-family participants, and the two building heating respondents in the sample of seven were not compelling as MF representatives so Navigant used the overall program-level FR and PSO values.
2021 NTG Values	**Direct Install (DI) In-Unit and Common Area (all DI measures except in-unit DI faucet aerators and in-unit DI showerheads) NTG: 0.96; Free Ridership: 0.05; Participant Spillover: 0.01** **Method:** Navigant research with CY2018 participants for FR and GPY6 participants for PSO. The free ridership results meet a 90% confidence interval within 5% precision, based on 15 respondents receiving pipe insulation or programmable thermostats from a population of 95 unique direct installation participants (property owners and managers) from 2018 from Nicor Gas, Peoples Gas, and North Shore Gas, excluding accounts that only installed showerheads and aerators. Participant Spillover from survey of 65 participants from a sample of Nicor Gas, Peoples Gas, and North Shore Gas GPY6 multi-family program participants. **Direct Install In-Unit Showerheads (when meeting TRM specifications for zero free ridership treatment) NTG: 1.01 Free Ridership: 0.00; Participant Spillover: 0.01** The IL TRM specifies that the free ridership for showerheads be set at zero when estimating gross savings using a baseline average flow rate that includes the effect of existing low flow fixtures. Participant Spillover from survey of 65 participants from a sample of Nicor Gas, Peoples Gas, and North Shore Gas GPY6 multi-family program participants.

	Direct Install In-Unit Faucet Aerators (when meeting TRM specifications for zero free ridership treatment) NTG: 1.01; Free Ridership: 0.00; Participant Spillover: 0.01 **Method:** The IL TRM specifies that the free ridership for aerators be set at zero when estimating gross savings using a baseline average flow rate that includes the effect of existing low flow fixtures. Participant Spillover from survey of 65 participants from a sample of Nicor Gas, Peoples Gas, and North Shore Gas GPY6 multi-family program participants. Multi-Family Comprehensive - Roll-up of Prescriptive, PTA, and Custom NTG: 0.87; Free Ridership 0.14; Participant Spillover: 0.01. **Method:** The IL TRM specifies that the free ridership for aerators be set at zero when estimating gross savings using a baseline average flow rate that includes the effect of existing low flow fixtures. Participant Spillover from survey of 65 participants from a sample of Nicor Gas, Peoples Gas, and North Shore Gas GPY6 multi-family program participants. Multi-Family Comprehensive Custom Incentives NTG; 0.72; Free Ridership: 0.31; Participant Spillover: 0.03. **Method:** FR (IL EM&V GPY4 for C&I Custom Program and IL EM&V GPY5 for MF Program), PSO, NPSO (PGL & NSG EM&V GPY5 for MF program). GPY4 research used TRM v5.0 algorithms, GPY5 research used TRM v6.0 algorithms. Multi-Family Comprehensive Roll-up of Prescriptive, PTA, and Custom NTG; 0.84; Free Ridership 0.19; Participant Spillover: 0.03 **Method:** FR, PSO, NPSO (PGL & NSG EM&V GPY5; TRM v6.0 algorithms). The roll-up NTG value covers Prescriptive, PTA, and Custom MF participants. The roll-up value may be used instead of the path-level NTGs. Multi-Family Comprehensive Gas Optimization NTG: 0.91; Free Ridership: 0.14; Participant Spillover 0.05 **Method:** FR and PSO: 2018 Survey of 7 GPY6 participants. Memo: Net-to-Gross Research Results from GPY6 for the Gas Optimization Study Offering, Navigant, 8/29/18, revised 9/13/18. The Gas Optimization offering has three paths: building heating, process, and steam plant. Multi-family buildings participate through the building heating path. Multi-Family specific GOS FR and PSO values are preferred if available. The GPY6 population did not have multi-family participants, and the two building heating respondents in the sample of seven were not compelling as MF representatives so Navigant used the overall program-level FR and PSO values.
2022 NTG Values	Direct Install (DI) In-Unit and Common Area (all DI measures except in-unit DI faucet aerators and in-unit DI showerheads) NTG: 0.96; Free Ridership: 0.05; Participant Spillover: 0.01 **Method:** Navigant research with CY2018 participants for FR and GPY6 participants for PSO. The free ridership results meet a 90% confidence interval within 5% precision, based on 15 respondents receiving pipe insulation or programmable thermostats from a population of 95 unique direct installation participants (property owners and managers) from 2018 from Nicor Gas, Peoples Gas, and North Shore Gas, excluding accounts that only installed showerheads and aerators. Participant Spillover from survey of 65 participants

	from a sample of Nicor Gas, Peoples Gas, and North Shore Gas GPY6 multi-family program participants. **Direct Install In-Unit Showerheads (when meeting TRM specifications for zero free ridership treatment) NTG: 1.01 Free Ridership: 0.00; Participant Spillover: 0.01** The IL TRM specifies that the free ridership for showerheads be set at zero when estimating gross savings using a baseline average flow rate that includes the effect of existing low flow fixtures. Participant Spillover from survey of 65 participants from a sample of Nicor Gas, Peoples Gas, and North Shore Gas GPY6 multi-family program participants. **Direct Install In-Unit Faucet Aerators (when meeting TRM specifications for zero free ridership treatment) NTG: 1.01; Free Ridership: 0.00; Participant Spillover: 0.01** **Method:** The IL TRM specifies that the free ridership for aerators be set at zero when estimating gross savings using a baseline average flow rate that includes the effect of existing low flow fixtures. Participant Spillover from survey of 65 participants from a sample of Nicor Gas, Peoples Gas, and North Shore Gas GPY6 multi-family program participants. **Multi-Family Comprehensive - All Prescriptive, PTA, and Custom Path Measures NTG: 0.87; Free Ridership 0.14; Participant Spillover: 0.01.** **Method:** Free ridership from Navigant analysis of 23 participant interviews conducted in 2019 of 2018 MF Program participants (C/P 90/9). Sample size not large enough for path-based estimates. NPSO (PGL & NSG EM&V GPY5 for MF program). Participant Spillover from survey of 65 participants from a sample of Nicor Gas, Peoples Gas, and North Shore Gas GPY6 multi-family program participants. **Multi-Family Comprehensive Gas Optimization** **NTG: 0.94; Free Ridership: 0.06; Participant Spillover 0.00** **Method:** (Guidehouse Research, 2021) Evaluation research consisting of 2019 and 2020 participating customers. Participant free-ridership of 6% and participant spillover of 0% from 5 participating customer NTG interviews completed from a population of 15 contacts from 11 accounts (representing 79% of population therm savings). Respondents did not include large multi-family buildings but large hotels were represented in the respondents, which have similar characteristics.
2023 NTG Values	**Direct Install (DI) In-Unit and Common Area (all DI measures except in-unit DI faucet aerators and in-unit DI showerheads) NTG: 0.96; Free Ridership: 0.05; Participant Spillover: 0.01** **Method:** Navigant research with CY2018 participants for FR and GPY6 participants for PSO. The free ridership results meet a 90% confidence interval within 5% precision, based on 15 respondents receiving pipe insulation or programmable thermostats from a population of 95 unique direct installation participants (property owners and managers) from 2018 from Nicor Gas, Peoples Gas, and North Shore Gas, excluding accounts that only installed showerheads and aerators. Participant Spillover from survey of 65 participants from a sample of Nicor Gas, Peoples Gas, and North Shore Gas GPY6 multi-family program participants.

	Direct Install In-Unit Showerheads (when meeting TRM specifications for zero free ridership treatment) NTG: 1.01 Free Ridership: 0.00; Participant Spillover: 0.01 The IL TRM specifies that the free ridership for showerheads be set at zero when estimating gross savings using a baseline average flow rate that includes the effect of existing low flow fixtures. Participant Spillover from survey of 65 participants from a sample of Nicor Gas, Peoples Gas, and North Shore Gas GPY6 multi-family program participants. **Direct Install In-Unit Faucet Aerators (when meeting TRM specifications for zero free ridership treatment) NTG: 1.01; Free Ridership: 0.00; Participant Spillover: 0.01** **Method:** The IL TRM specifies that the free ridership for aerators be set at zero when estimating gross savings using a baseline average flow rate that includes the effect of existing low flow fixtures. Participant Spillover from survey of 65 participants from a sample of Nicor Gas, Peoples Gas, and North Shore Gas GPY6 multi-family program participants. **Multi-Family Comprehensive - Path-Based Estimates - All Prescriptive, PTA, and Custom Path Measures NTG: 0.87; Free Ridership 0.00; Participant Spillover: 0.00.** **Method:** Free ridership from Navigant analysis of 23 participant interviews conducted in 2019 of 2018 MF Program participants (C/P 90/9). Sample size not large enough for path-based estimates. NPSO (PGL & NSG EM&V GPY5 for MF program). Participant Spillover from survey of 65 participants from a sample of Nicor Gas, Peoples Gas, and North Shore Gas GPY6 multi-family program participants. **Multi-Family Comprehensive Gas Optimization** **NTG: 0.94; Free Ridership: 0.06; Participant Spillover 0.00** **Method:** (Guidehouse Research, 2021) Evaluation research consisting of 2019 and 2020 participating customers. Participant free-ridership of 6% and participant spillover of 0% from 5 participating customer NTG interviews completed from a population of 15 contacts from 11 accounts (representing 79% of population therm savings). Respondents did not include large multi-family buildings but large hotels were represented in the respondents, which have similar characteristics.
2024 NTG Values	**Direct Install (DI) In-Unit and Common Area (all DI measures except in-unit DI faucet aerators and in-unit DI showerheads) NTG: 0.96; Free Ridership: 0.05; Participant Spillover: 0.01** **Method:** Navigant research with CY2018 participants for FR and GPY6 participants for PSO. The free ridership results meet a 90% confidence interval within 5% precision, based on 15 respondents receiving pipe insulation or programmable thermostats from a population of 95 unique direct installation participants (property owners and managers) from 2018 from Nicor Gas, Peoples Gas, and North Shore Gas, excluding accounts that only installed showerheads and aerators. Participant Spillover from survey of 65 participants from a sample of Nicor Gas, Peoples Gas, and North Shore Gas GPY6 multi-family program participants.

	Direct Install In-Unit Showerheads (when meeting TRM specifications for zero free ridership treatment) NTG: 1.01 Free Ridership: 0.00; Participant Spillover: 0.01 The IL TRM specifies that the free ridership for showerheads be set at zero when estimating gross savings using a baseline average flow rate that includes the effect of existing low flow fixtures. Participant Spillover from survey of 65 participants from a sample of Nicor Gas, Peoples Gas, and North Shore Gas GPY6 multi-family program participants. **Direct Install In-Unit Faucet Aerators (when meeting TRM specifications for zero free ridership treatment) NTG: 1.01; Free Ridership: 0.00; Participant Spillover: 0.01** **Method:** The IL TRM specifies that the free ridership for aerators be set at zero when estimating gross savings using a baseline average flow rate that includes the effect of existing low flow fixtures. Participant Spillover from survey of 65 participants from a sample of Nicor Gas, Peoples Gas, and North Shore Gas GPY6 multi-family program participants. **Multi-Family Comprehensive - Path-Based Estimates - All Prescriptive and Custom Path Measures NTG: 0.87; Free Ridership 0.14; Participant Spillover: 0.01.** **Method:** Free ridership from Navigant analysis of 23 participant interviews conducted in 2019 of 2018 MF Program participants (C/P 90/9). Sample size not large enough for path-based estimates. Participant Spillover from survey of 65 participants from a sample of Nicor Gas, Peoples Gas, and North Shore Gas GPY6 multi-family program participants. NPSO applies to Participating Trade Ally path from 2023 survey of PTA, memo PGL NSG Multifamily Participating Trade Ally Spillover Memo Draft 08-30-2023. **Multi-Family Comprehensive - Path-Based Estimates Partner Trade Allies Measures NTG: 0.88; Free Ridership 0.14; Participant Spillover: 0.01.** **Method:** Free ridership from Navigant analysis of 23 participant interviews conducted in 2019 of 2018 MF Program participants (C/P 90/9). Sample size not large enough for path-based estimates. Participant Spillover from survey of 65 participants from a sample of Nicor Gas, Peoples Gas, and North Shore Gas GPY6 multi-family program participants. NPSO applies to Participating Trade Ally path from 2023 survey of PTA, memo PGL NSG Multifamily Participating Trade Ally Spillover Memo Draft 08-30-2023. **Multi-Family Comprehensive Gas Optimization** **NTG: 0.94; Free Ridership: 0.06; Participant Spillover 0.00** **Method:** Free ridership from Navigant analysis of 23 participant interviews conducted in 2019 of 2018 MF Program participants (C/P 90/9). Sample size not large enough for path-based estimates. Participant Spillover from survey of 65 participants from a sample of Nicor Gas, Peoples Gas, and North Shore Gas GPY6 multi-family program participants. NPSO applies to Participating Trade Ally path from 2023 survey of PTA, memo PGL NSG Multifamily Participating Trade Ally Spillover Memo Draft 08-30-2023.
2025 NTG Values	**Assessment/Direct Install (all measures except faucet aerators and showerheads when using TRM specified baseline average water flow rates) NTG: 0.96; Free Ridership: 0.05; Participant Spillover: 0.01**

	Method: FR, PSO, NPSO (PGL & NSG EM&V GPY5; TRM v6.0 algorithms). Participant spillover was not estimated by program path; the 0.03 value represents the overall MF program based on 59 interviews conducted in the GPY5 MF NTG research. Trade ally interviews did not find PSO or NPSO. **Assessment/Direct Install (faucet aerators and showerheads when using TRM specific baseline average water flow rates) NTG:** 1.01 TRM version 7.0 specifies that the free ridership for faucet aerators and showerheads be set at zero when estimating gross savings using the TRM specified baseline average water flow rate. PSO =0.03 based on 59 interviews conducted in the GPY5 MF NTG research. Trade ally interviews did not find PSO or NPSO. **Multi-Family Comprehensive Prescriptive Rebates** **NTG: 0.87; Free Ridership: 0.14; Participant Spillover: 0.01** **Method:** FR, PSO, NPSO (PGL & NSG EM&V GPY5; TRM v6.0 algorithms) **Multi-Family Comprehensive TAPI Incentives/Partner Trade Allies** **NTG: 0.88; Free Ridership 0.14; Participant Spillover: 0.01; Non-Participant Spillover: 0.01.** **Method:** FR, PSO, NPSO (PGL & NSG EM&V GPY5; TRM v6.0 algorithms) **Multi-Family Comprehensive Custom Incentives** **NTG; 0.87; Free Ridership: 0.14; Participant Spillover: 0.01.** **Method:** FR (IL EM&V GPY4 for C&I Custom Program and IL EM&V GPY5 for MF Program), PSO, NPSO (PGL & NSG EM&V GPY5 for MF program). GPY4 research used TRM v5.0 algorithms, GPY5 research used TRM v6.0 algorithms. **Multi-Family Comprehensive Roll-up of Prescriptive, PTA, and Custom** **NTG; 0.87; Free Ridership 0.14; Participant Spillover: 0.01; PTA Non-Participant Spillover: 0.01** **Method:** FR, PSO, NPSO (PGL & NSG EM&V GPY5; TRM v6.0 algorithms). The roll-up NTG value covers Prescriptive, PTA, and Custom MF participants. The roll-up value may be used instead of the path-level NTGs. **Multi-Family Comprehensive Gas Optimization** **NTG: 0.94; Free Ridership: 0.06; Participant Spillover 0.00** **Method:** (Guidehouse Research, 2021) Evaluation research consisting of 2019 and 2020 participating customers. Participant free ridership of 6% and participant spillover of 0% from 5 participating customer NTG interviews completed from a population of 15 contacts from 11 accounts (representing 79% of population therm savings). Respondents did not include large multi-family buildings but large hotels were represented in the respondents, which have similar characteristics.

Source: Annual NTG Recommendations