



Commuter Impacts & Behavior Changes due to the Fix I-5 Reconstruction Project

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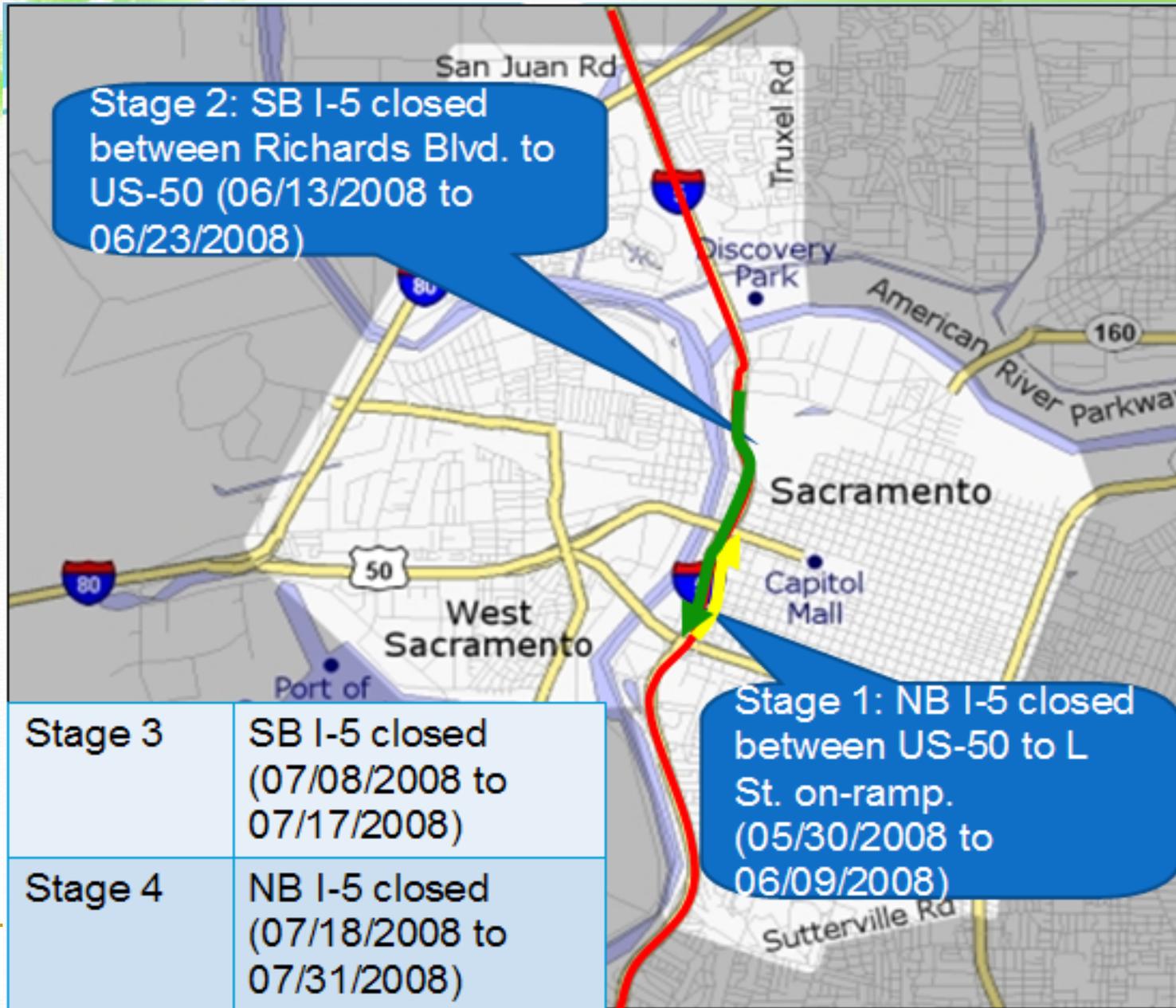
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Outline

- ❖ Introduction
 - ❖ Sampling and survey
 - ❖ Baseline commute characteristics
 - ❖ Passive impacts
 - ❖ Active choices
 - ❖ “Increase transit use” model
 - ❖ A glimpse of behavior 6 months later
 - ❖ Conclusions
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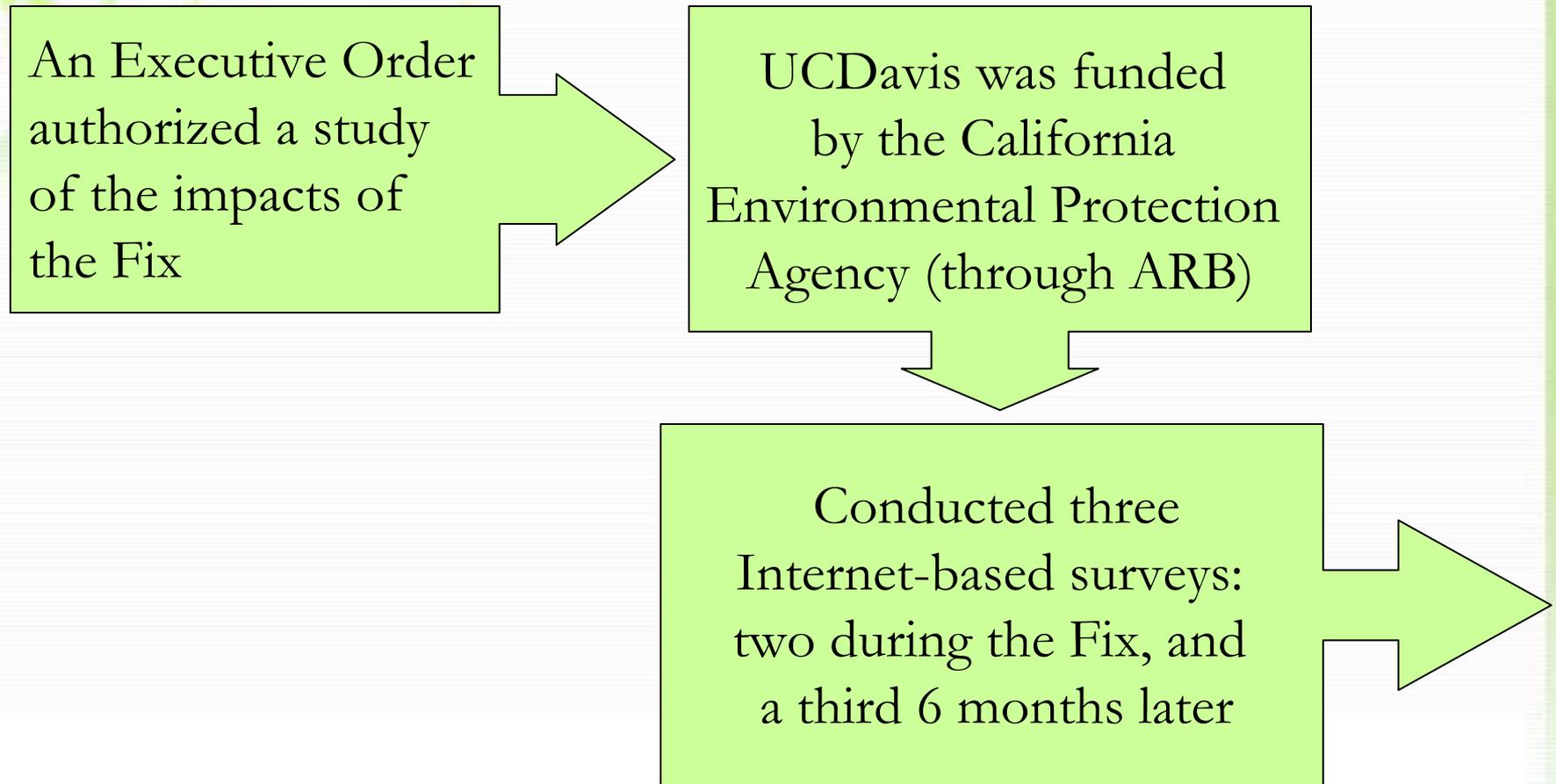
Introduction



Introduction – strategies implemented

- ❖ Providing extensive information
 - ❖ Funding increased transit service
 - ❖ Reducing (some) transit fares
 - ❖ Offering free parking at some facilities
 - ❖ Reducing off-street parking rates in downtown after 5 p.m.
 - ❖ Providing roving tow truck service
 - ❖ Directing State executive agencies to promote commute alternatives (such as telecommuting, alternative work schedules, and transit) to employees
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Introduction – key steps



Introduction – some key analyses (Waves 1 & 2)

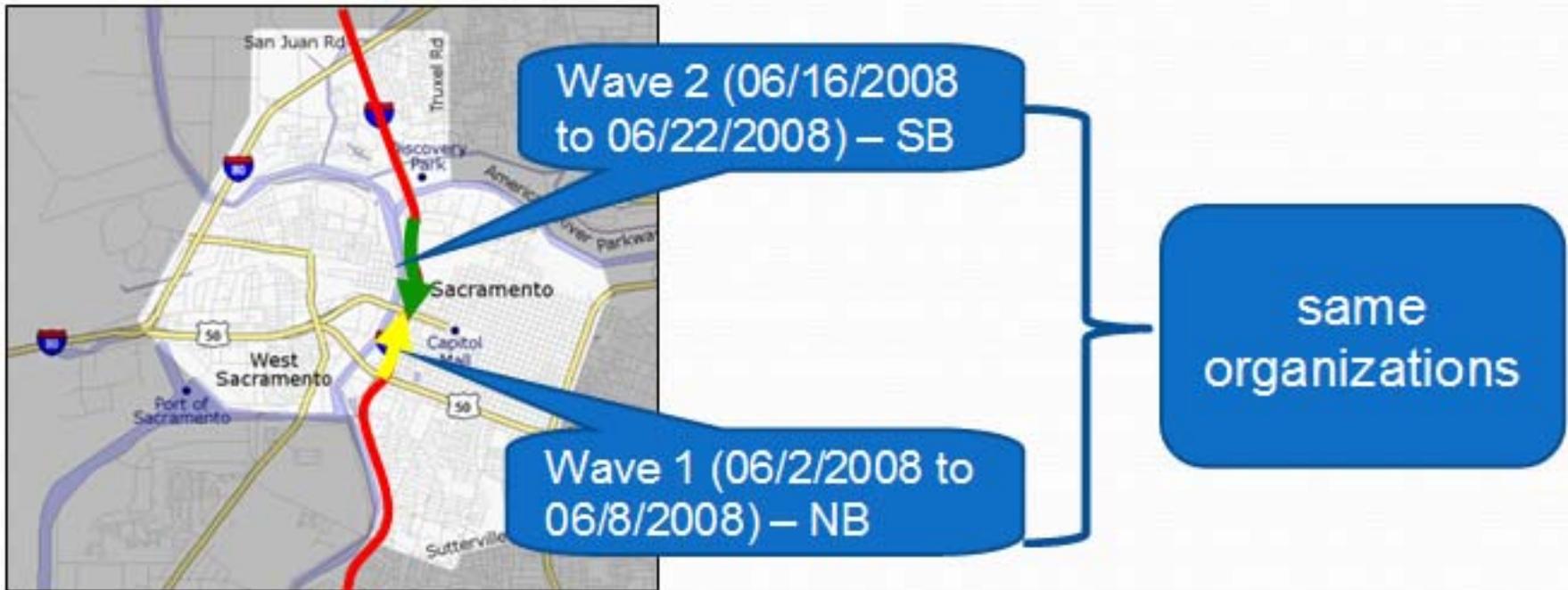
- ❖ Significant differences, by three ways to divide:
 - ❖ wave
 - ❖ gender
 - ❖ “impact group”
- ❖ Do women experience impacts more heavily than men?
- ❖ Are women less or more likely than men to make changes?

- ❖ By each division, we examine differences in
 - ❖ passive impacts
 - ❖ active choices
- ❖ “Increase transit use” model

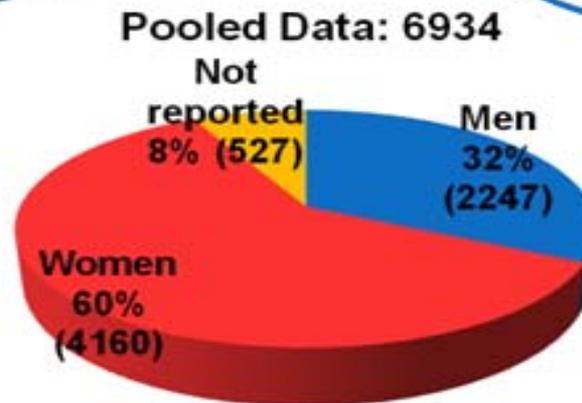
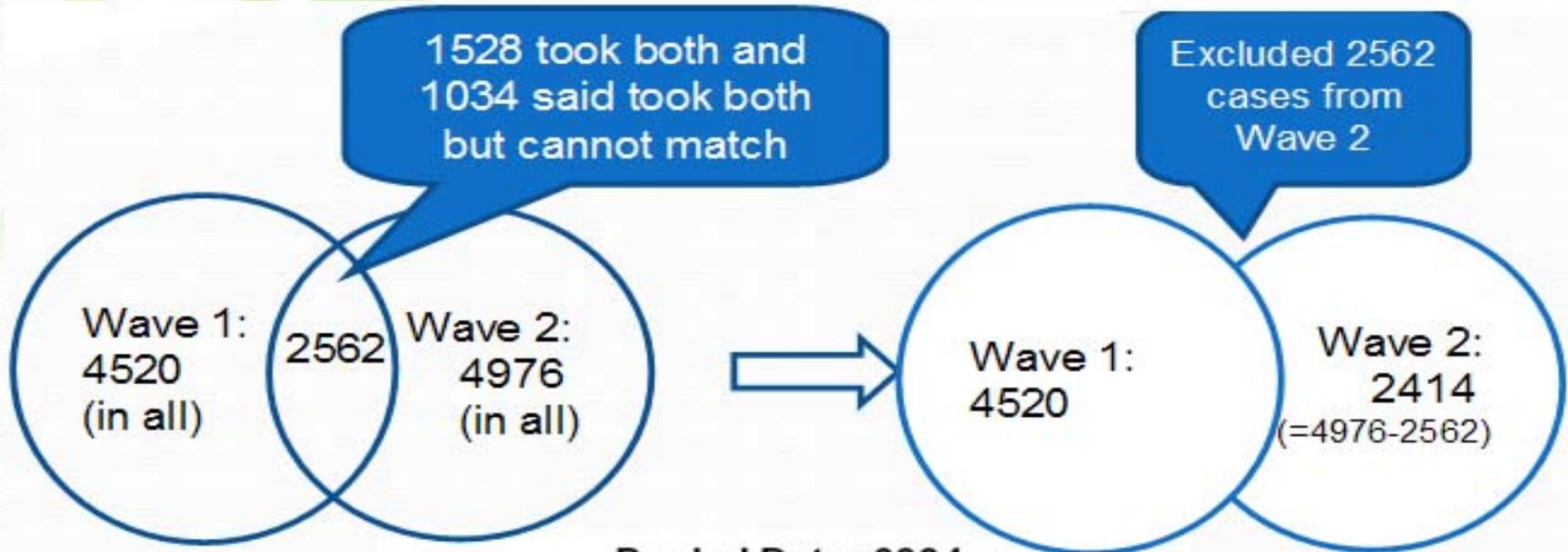
Sampling and survey – data collection

Obtained respondents via e-mail invitations to organizations:

- ❖ Numerous State agencies
- ❖ The Fix I-5 listserv (6K subscribers)
- ❖ Transportation Management Agencies (TMAs)
- ❖ The Commuter Club of the Sacramento TMA (25K subscribers)



Sampling and survey (cont.)



Selected characteristics (averages)

- ❖ Age: 47 years old
 - ❖ Education: college graduate
 - ❖ Household size: 2.7 members
 - ❖ Household vehicles: 2.1 cars
 - ❖ Income: 60% of the sample has an annual household income of \$75,000 or more
-

Selected characteristics (cont.)

- ❖ Wave 2 people tend to have slightly higher household income than wave 1 people, essentially same education, slightly younger, more likely to work part-time
 - ❖ Women tend to have lower household income than men, less education, slightly younger, more likely to hold clerical positions and more likely to work part-time
-

Survey contents

Four parts in each survey (Wave 1 and Wave 2 nearly identical):

- ❖ **Part A:** “normal” (pre-Fix) work and commute patterns
- ❖ **Part B:** travel changes made during the target week
- ❖ **Part C:** commute-related programs, possible facilitators and barriers to changing commuting habits, and sources of information on Fix I-5
- ❖ **Part D:** sociodemographic characteristics

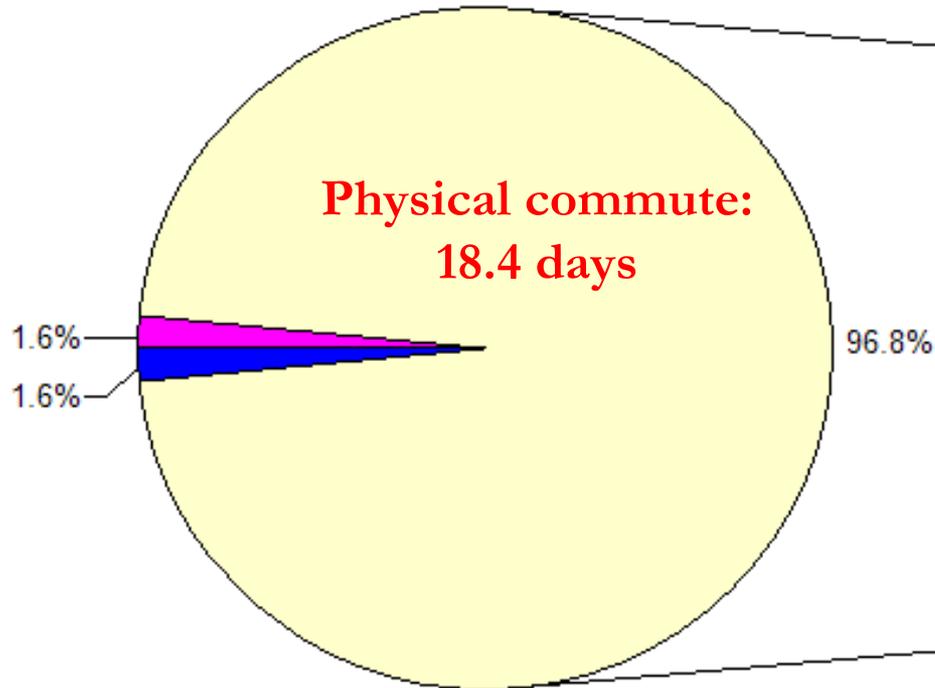
Baseline commute characteristics

The number of days out of 28 (4 weeks) that respondents:

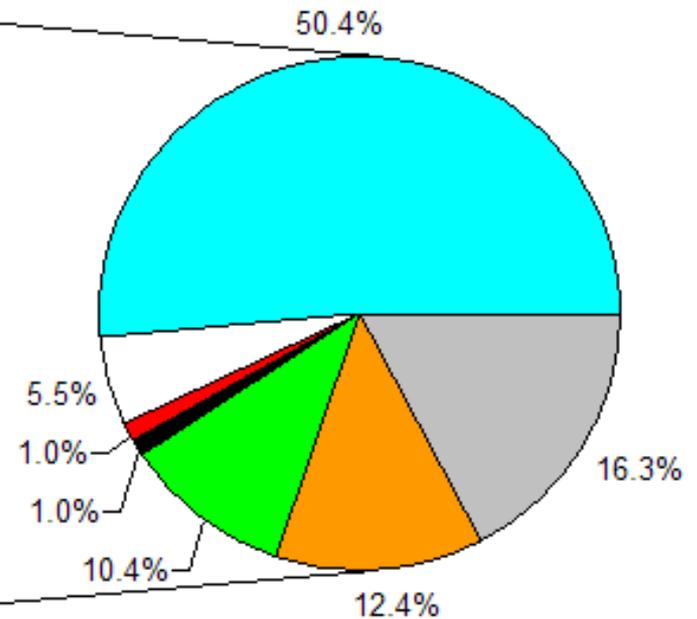
- ❖ Worked at home as the regular location (home-based business)
- ❖ Worked at home instead of commuting (telecommuting)
- ❖ Physically commuted:
 - **Drove alone** for *most* of the commute
 - **Car/vanpooled** for *most* of the commute
 - **Rode a bus** for *any portion* of the commute
 - **Rode light rail** for *any portion* of the commute
 - **Rode Amtrak** for *any portion* of the commute
 - **Walked** for the *entire* commute
 - **Rode a bicycle** for *any portion* of the commute

Work schedule and commute options (in a 4-wk period)

Work days
(ave N=19.0)



Commute days
(ave N=18.4)



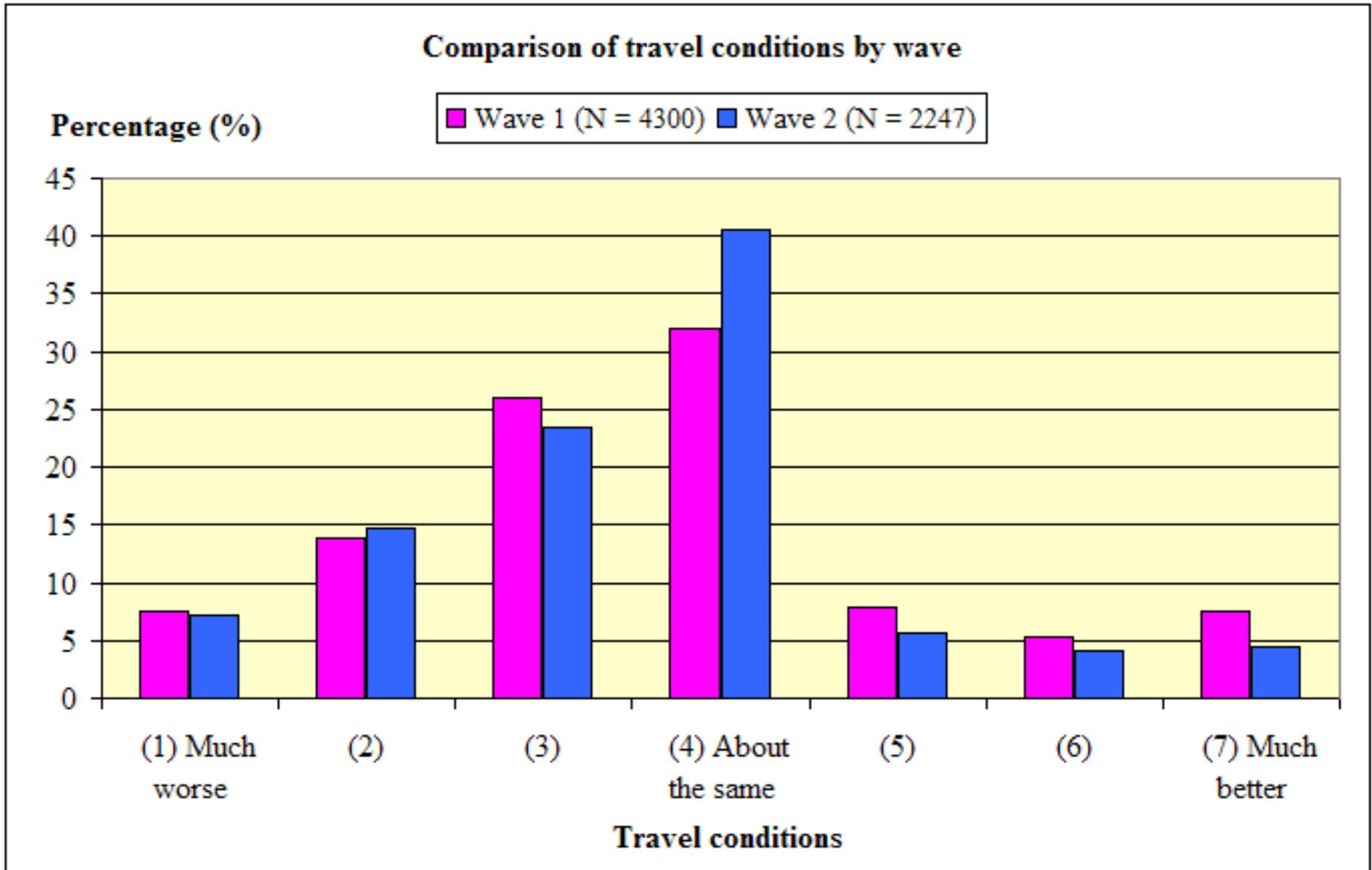
- Work-at-home as regular workplace: 0.3 day
- Drive alone for most of the commute: 10.2 days
- Ride a bus for any portion of the commute: 2.5 days
- Ride Amtrak for any portion of the commute: 0.2 day
- Ride a bicycle for any portion of the commute: 1.1 days

- Work-at-home instead of commuting: 0.3 day
- Car/vanpool for most of the commute: 3.3 days
- Ride light rail for any portion of the commute: 2.1 days
- Walk for the entire commute: 0.2 day

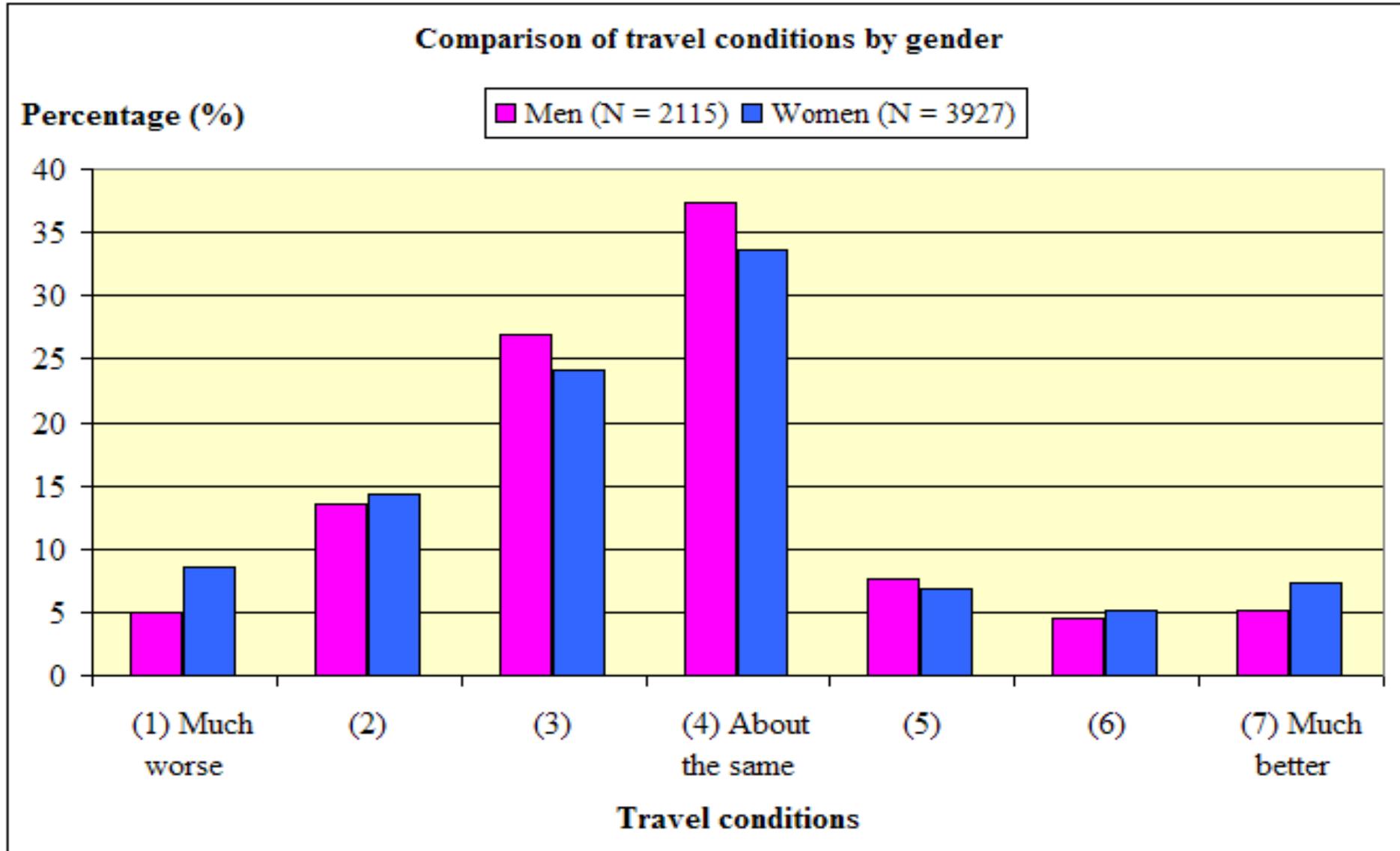
Definition of “impact group”

- ❖ Definition is not clean (survey design flaw)
 - ❖ Restricted primarily to regional commuters, i.e. probably includes few local residents
 - ❖ Still, useful to compare:
 - those who explicitly reported **using the affected link of I-5 in their normal commute**, and thus HAD to make some change (N=186 – only a subset of all those who did), and
 - those who explicitly reported **not using the affected link** (N=597 – again, only a subset)
-

Passive impacts: with respect to travel conditions (by wave)



Passive impacts: with respect to travel conditions (by gender)

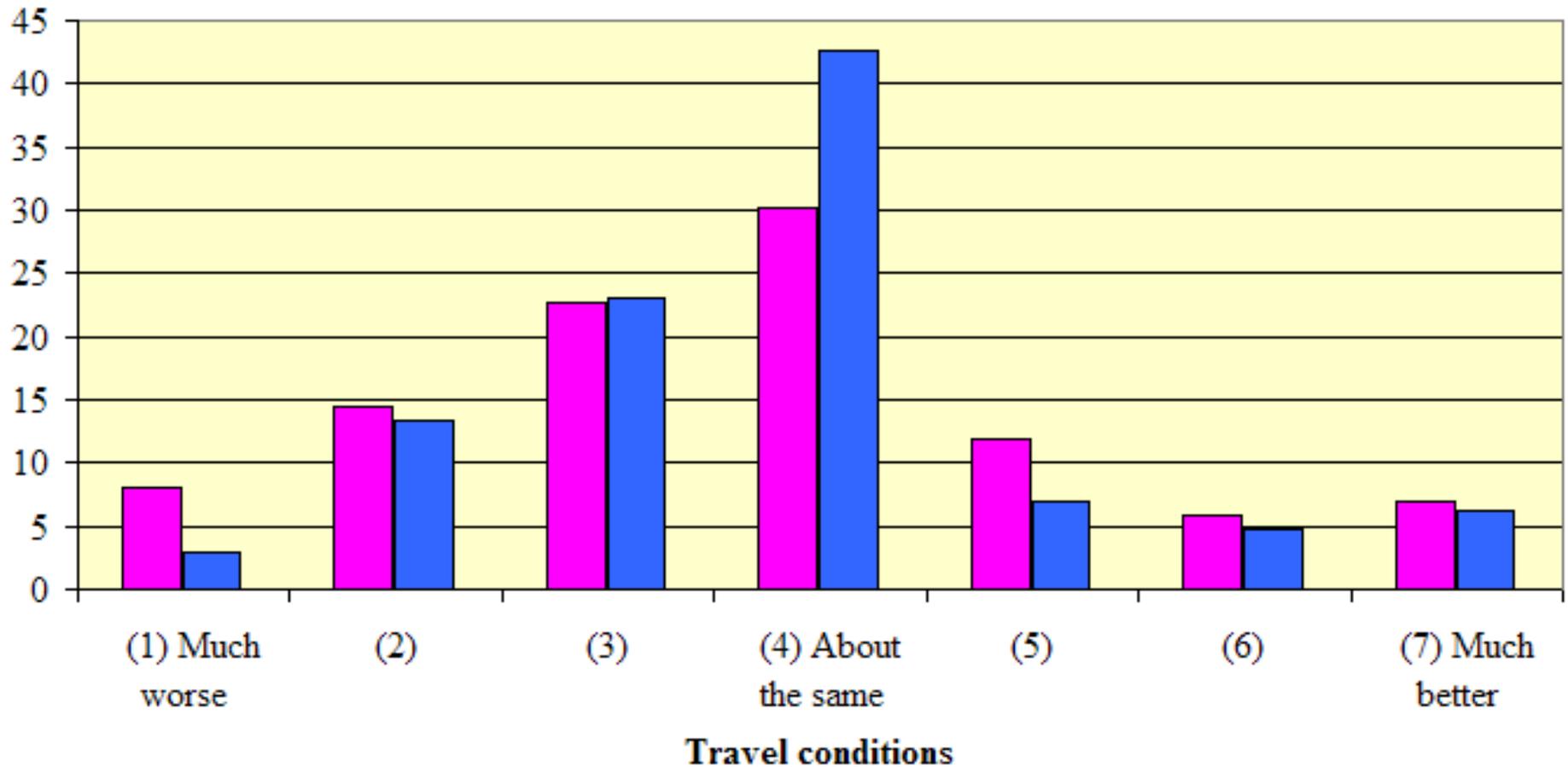


Passive impacts: with respect to travel conditions (by impact group)

Comparison of travel conditions by impact group

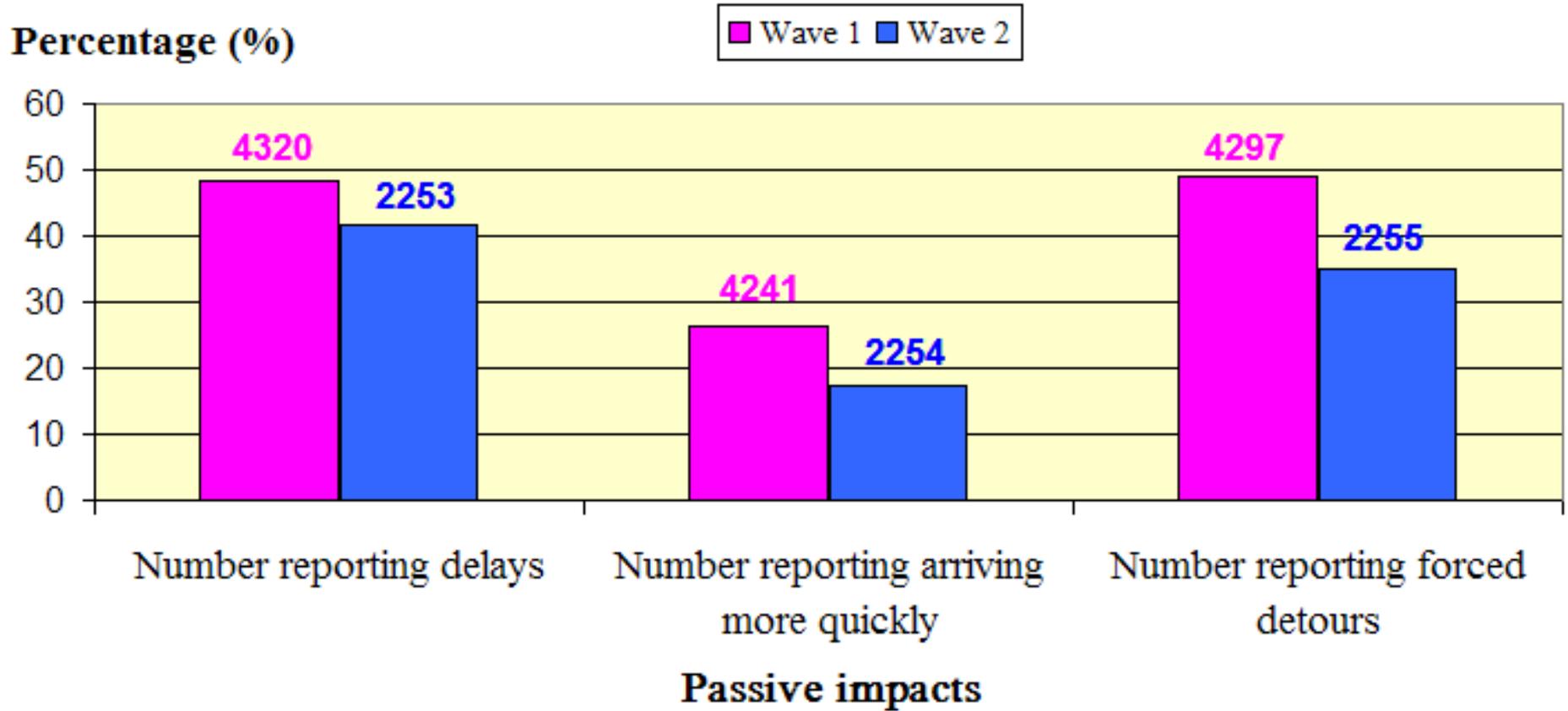
Percentage (%)

■ Used Fix segment (N = 186) ■ Did not use Fix segment (N = 597)



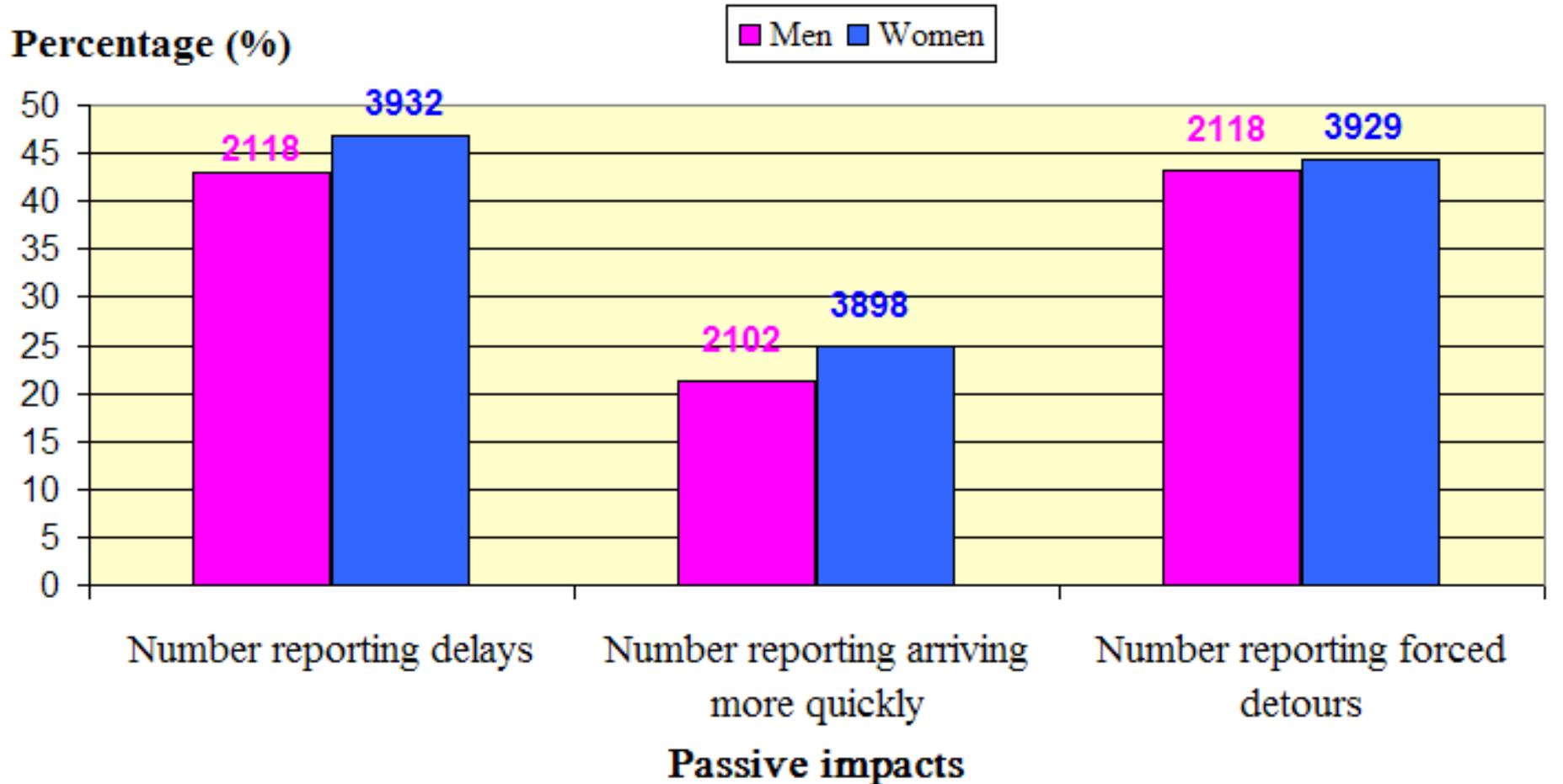
Other passive impacts (by wave)

Comparison of other passive impacts by wave



Other passive impacts (by gender)

Comparison of other passive impacts by gender

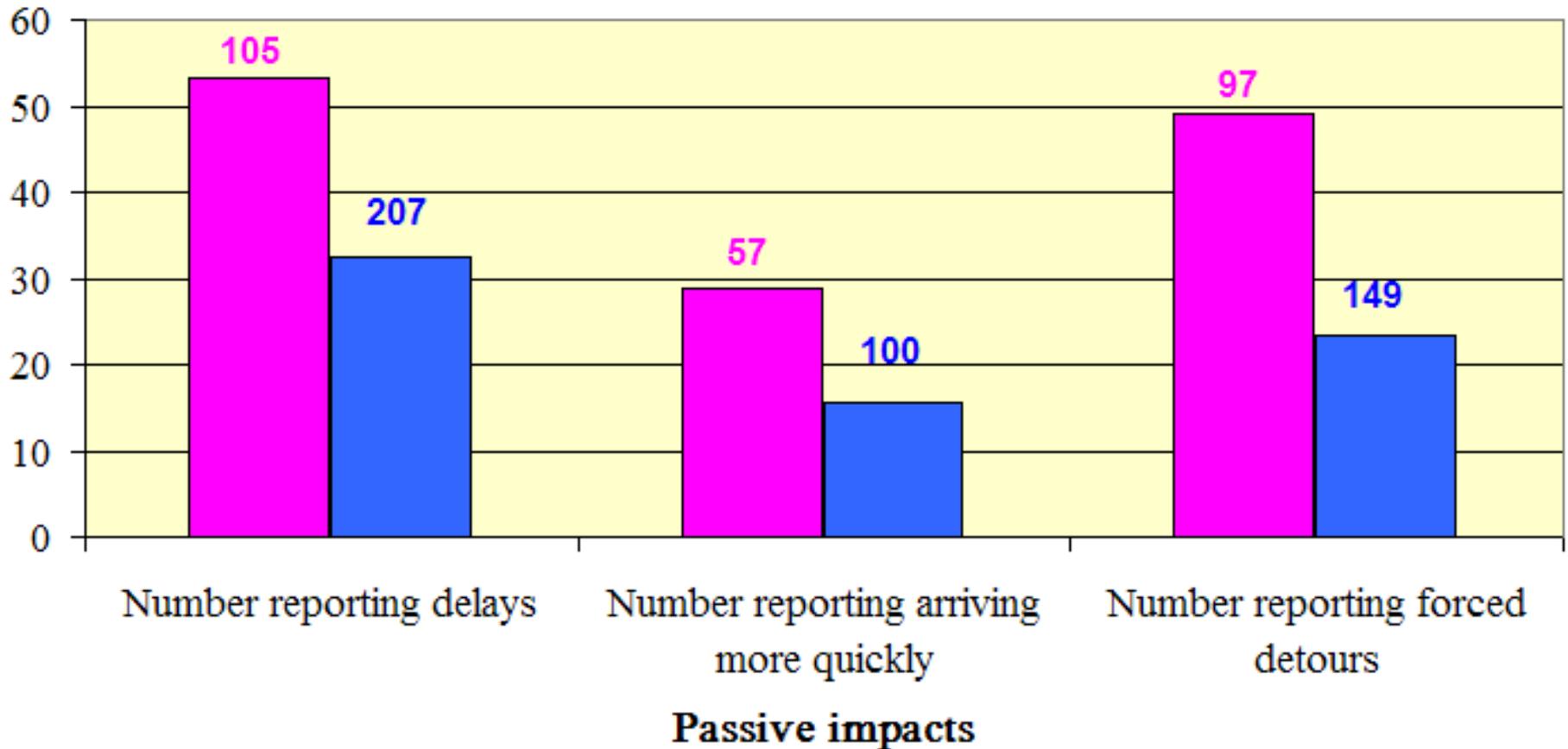


Other passive impacts (by impact group)

Comparison of other passive impacts by impact group

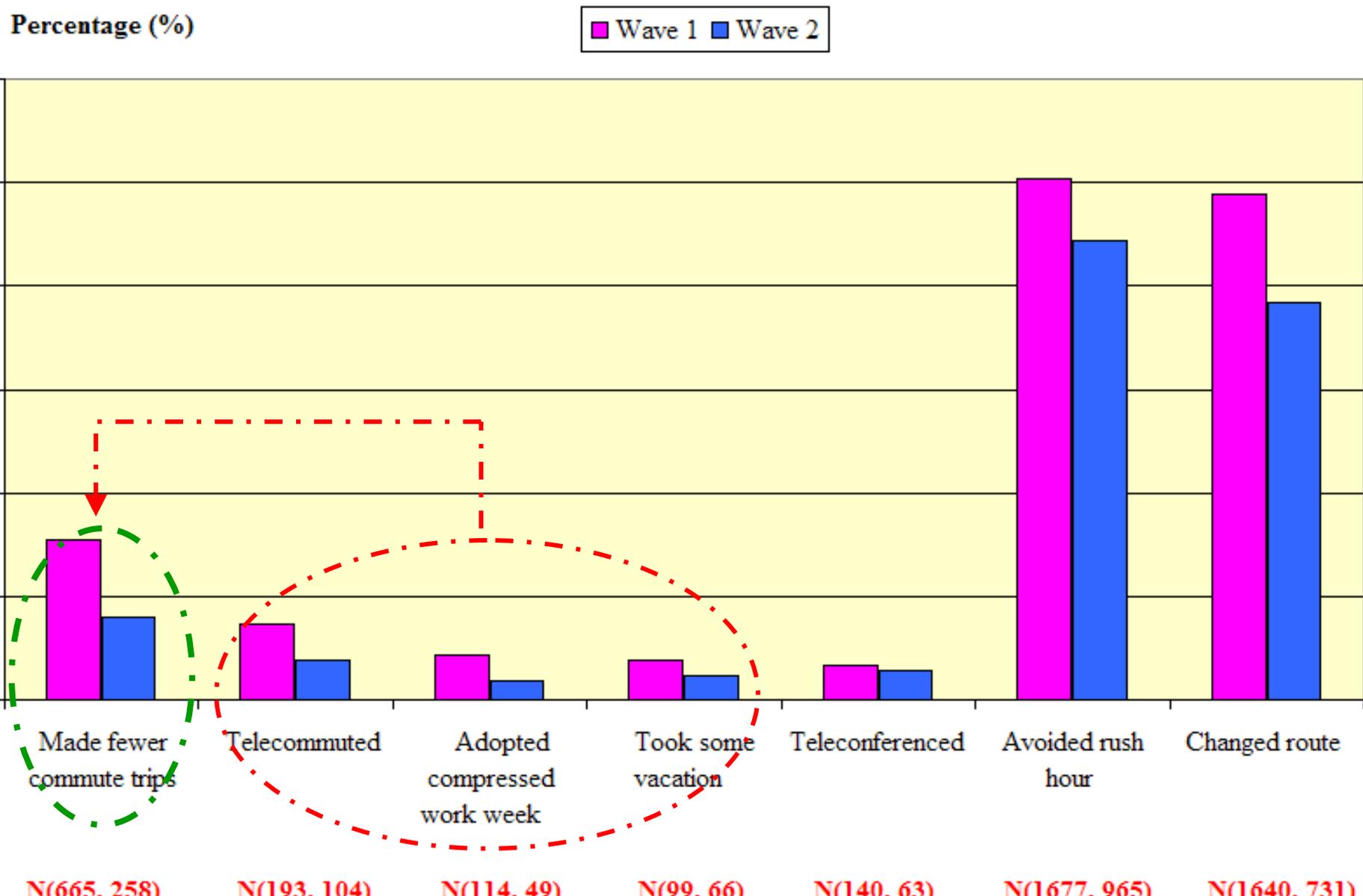
Percentage (%)

■ Used Fix segment ■ Did not use Fix segment



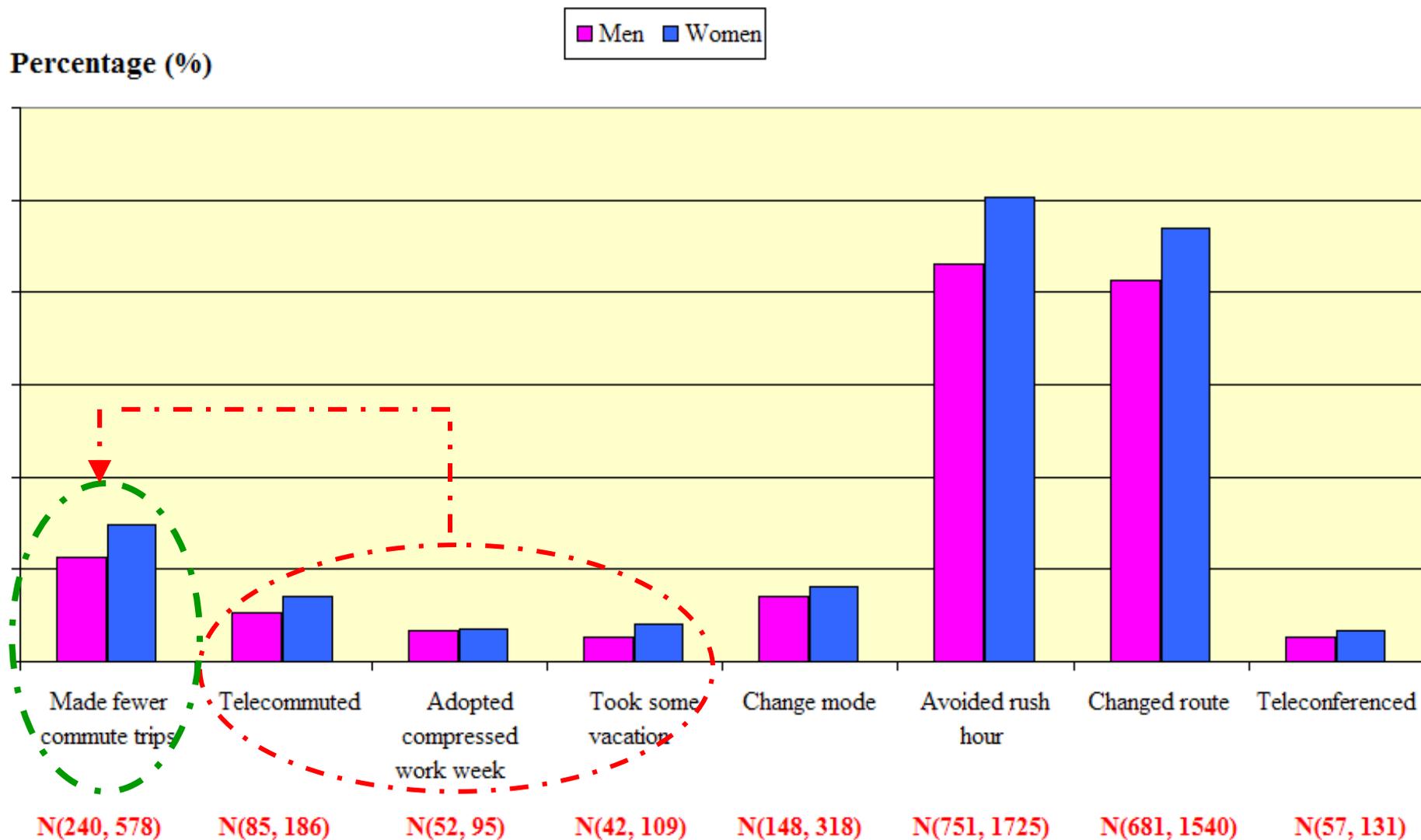
Active choices: changes in work-related trips (by wave)

Comparison of work related trips by wave



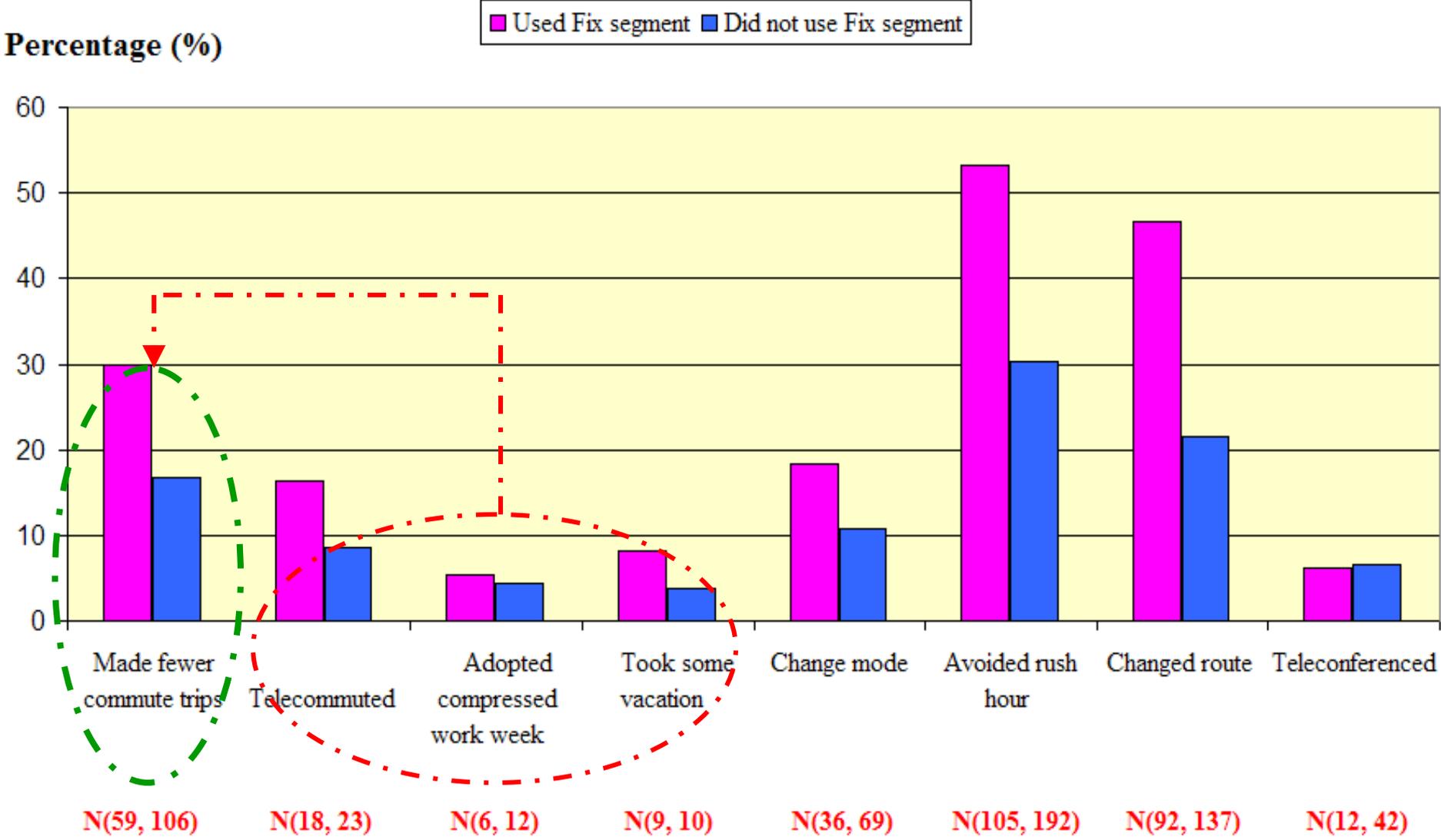
Active choices: changes in work-related trips (by gender)

Comparison of work related trips by gender

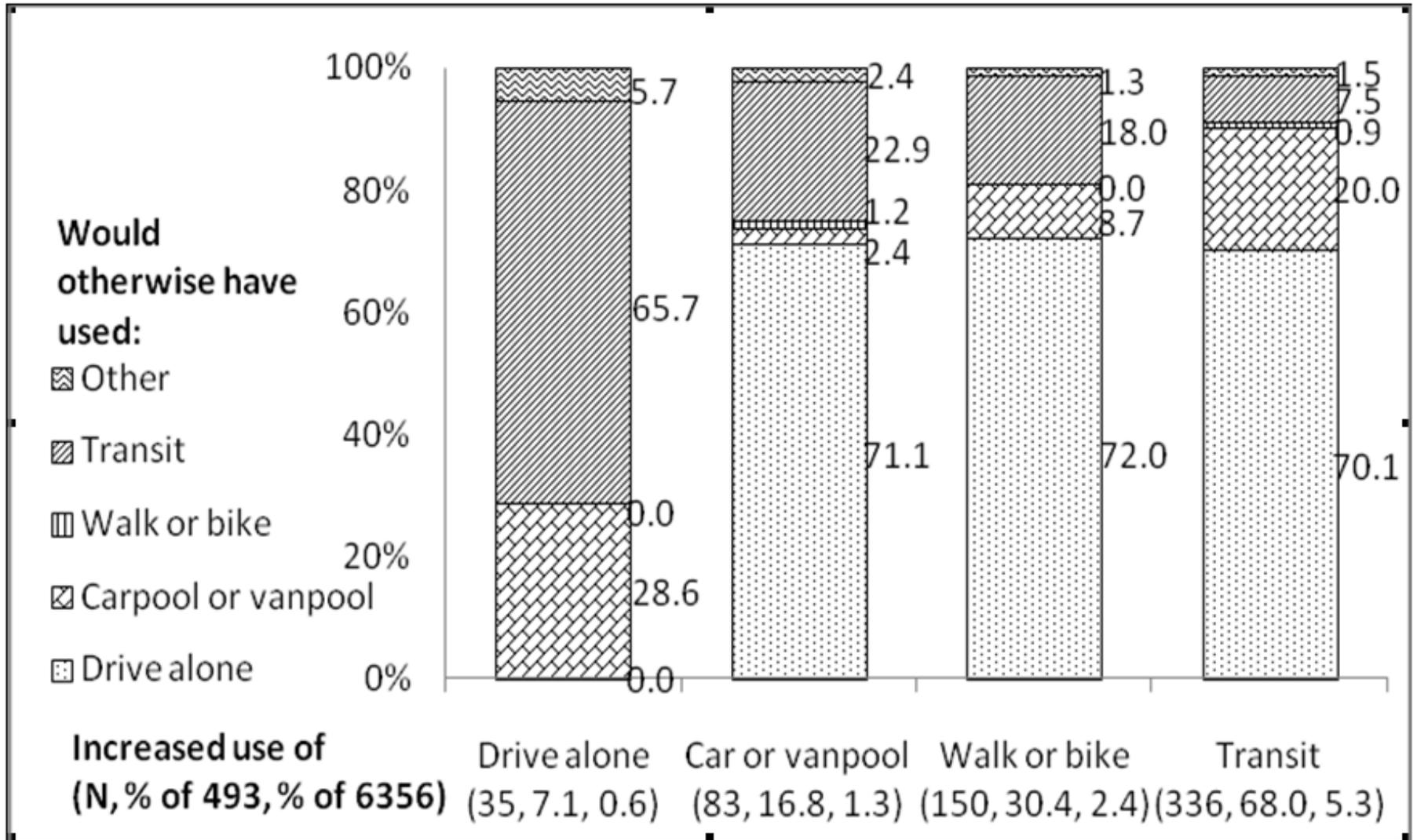


Active choices: changes in work-related trips (by impact group)

Comparison of work related trips by impact group



Mode shifts (pooled data)

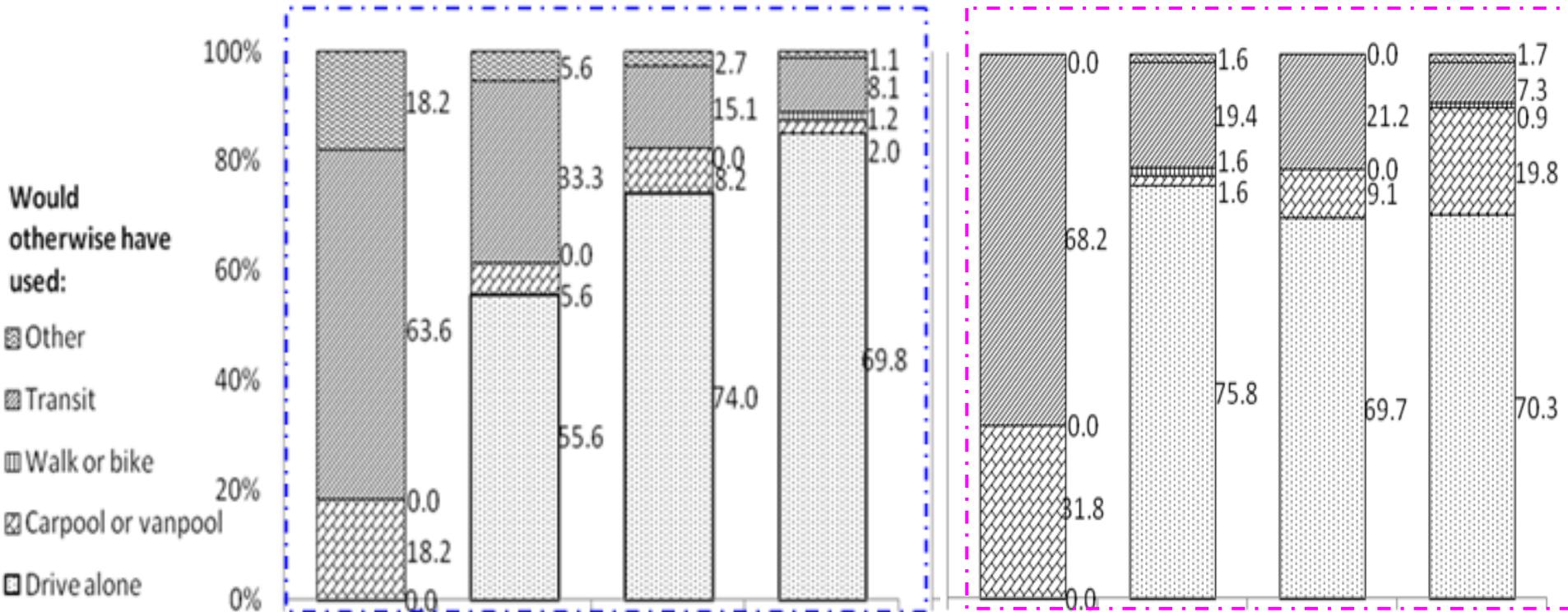


Total N = 6356; N changing = 493 (7.8%)

Mode shifts (by gender)

Men

Women



Men: Total N = 2073; N changing = 148 (7.0%)

Increased use of

	Drive alone	Car or vanpool	Walk or bike	Transit
(N, % of 148, % of 2073)	(11, 7.4, 0.5)	(18, 12.2, 0.9)	(73, 49.3, 3.5)	(86, 58.1, 4.2)

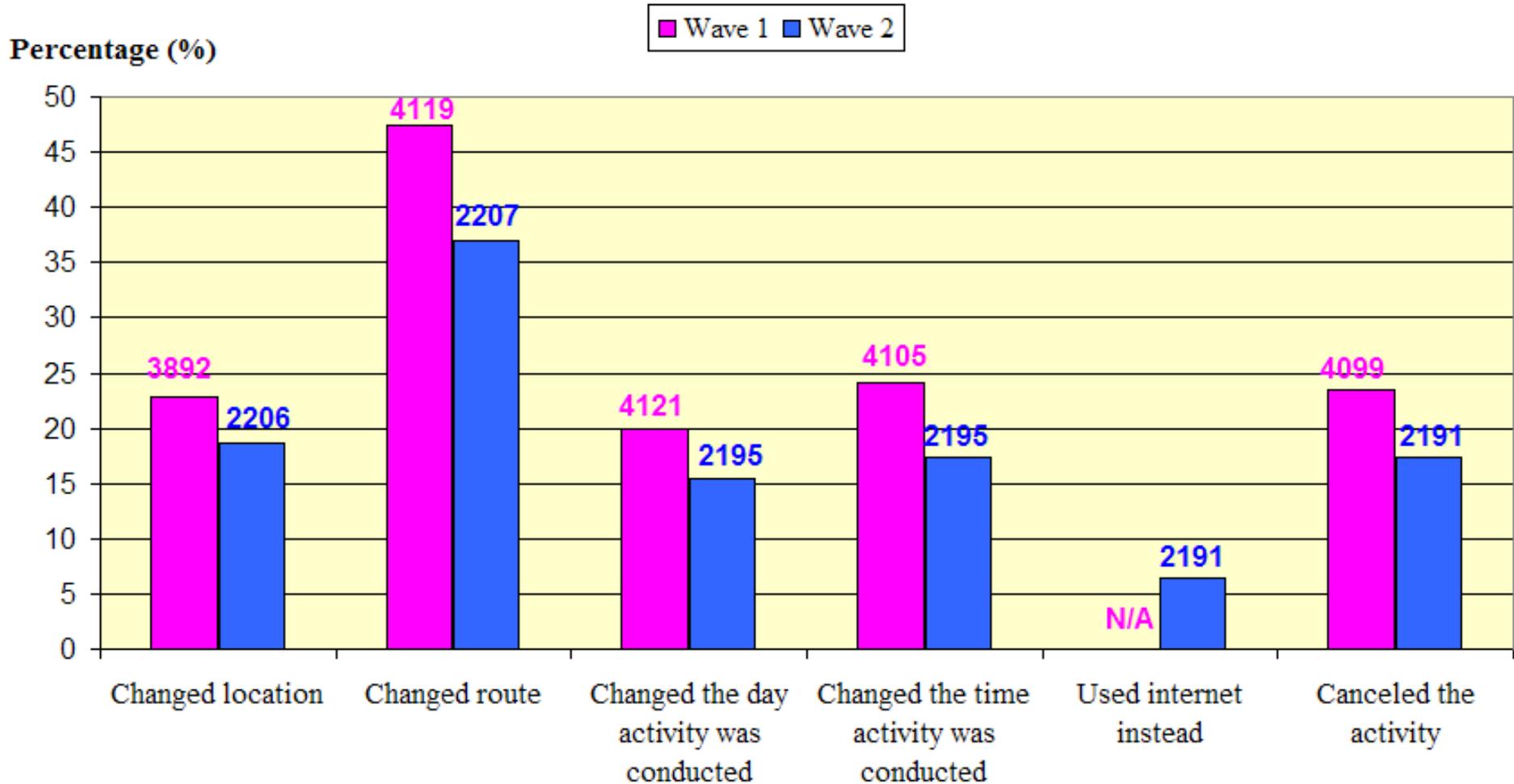
Women: Total N = 3837; N changing = 318 (8.1%)

Increased use of

	Drive alone	Car or vanpool	Walk or bike	Transit
(N, % of 318, % of 3837)	(22, 6.9, 0.6)	(62, 19.5, 1.6)	(66, 20.8, 1.7)	(232, 73.0, 6.1)

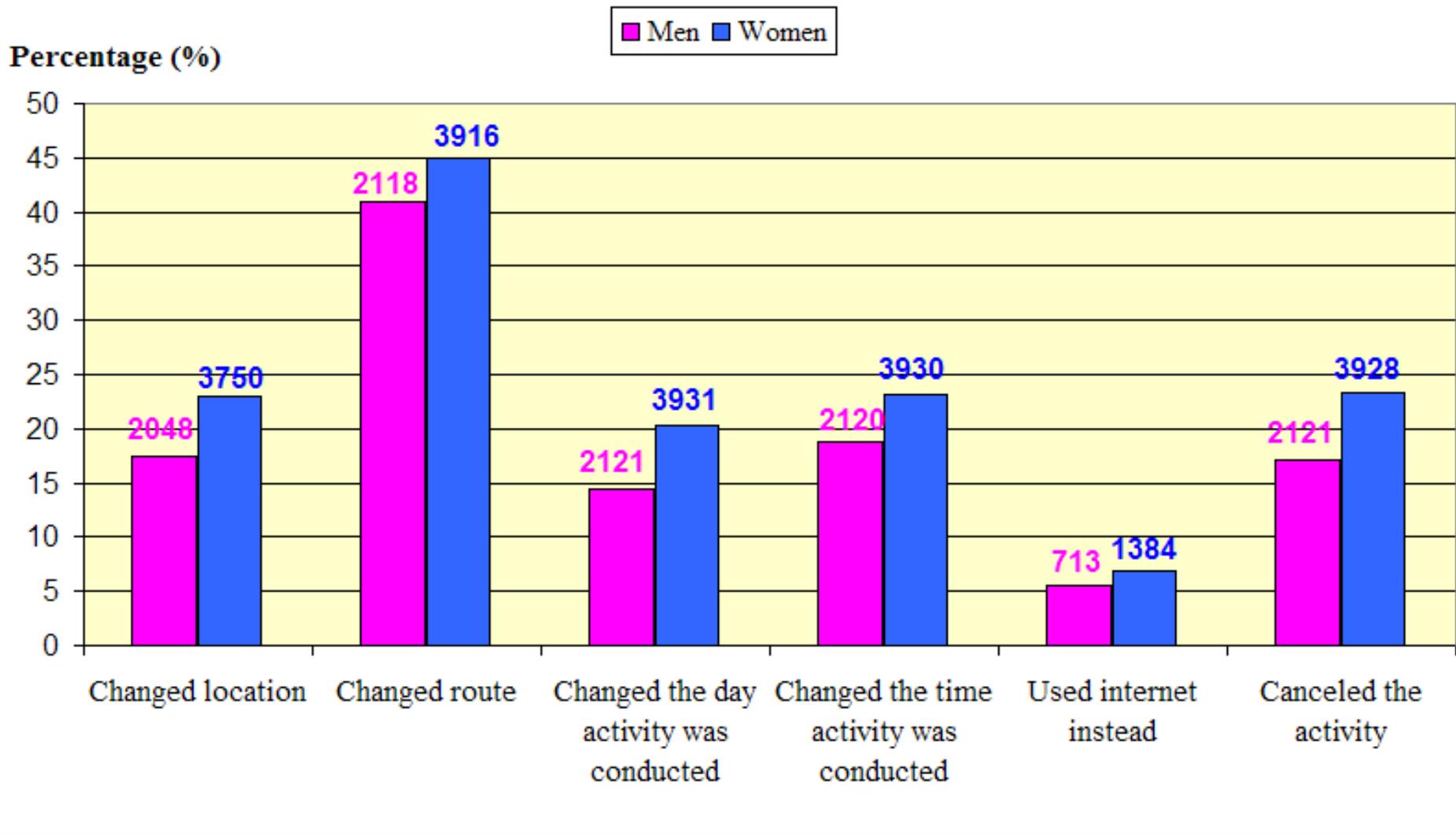
Active choices: changes in non-work-related trips (by wave)

Comparison of non-work related trips by wave



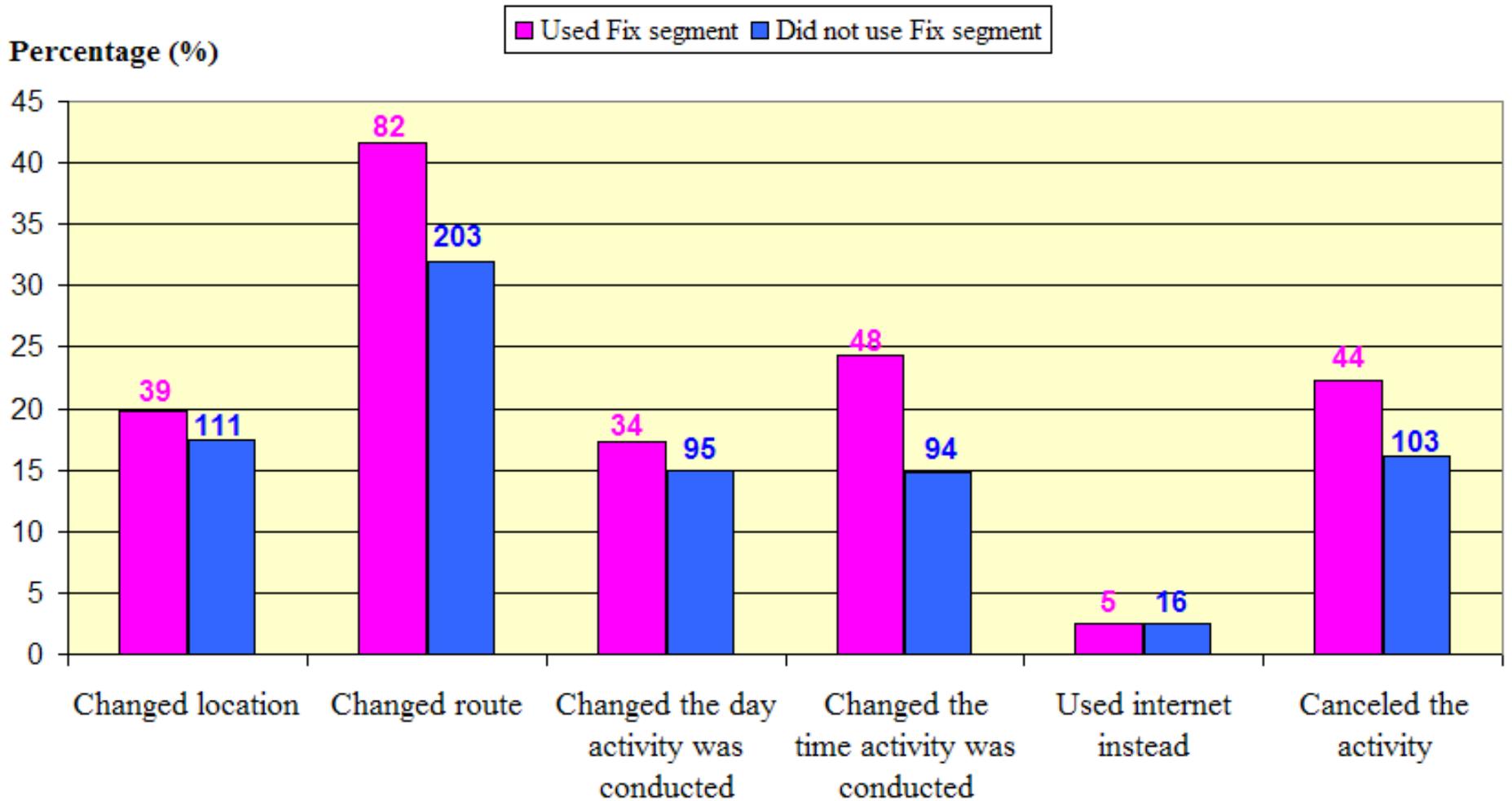
Active choices: changes in non-work-related trips (by gender)

Comparison of non-work related trips by gender



Active choices: changes in non-work-related trips (by impact group)

Comparison of non-work related trips by impact group



“Increase transit use” model

- ❖ **Methodology:**

 - binary logit model

- ❖ **Dependent variable (dummy):**

 - increase transit use (yes: 1; no: 0)

- ❖ **N of cases:**

 - 4636 (yes: 214; no: 4422)

- ❖ ρ_{ELbase}^2 : 0.766

“Increase transit use” model (cont.)

- ❖ Significant independent variables:
 - ❖ Sociodemographics
 - Household size (female) [+];
 - Manager/administration occupation (male) [+];
 - ❖ Mode usage
 - Transit primary commute mode [+1.35];
 - Currently use transit but not primary mode [+2.23];
 - ❖ Awareness of Fix impact mitigation strategies
 - Heard about increasing number of buses [+];
 - ❖ Employer-provided commute strategies
 - Reduced-rate transit passes (female) [+];
 - Variable start/end times (female) [-].
-

Wave 3: 6 months later

- ❖ In January/February 2009, re-surveyed Wave 1 & 2 respondents who had given us permission to do so
 - ❖ Obtained ~2000 usable responses
 - ❖ Data are now largely clean and ready for serious analysis
-

Wave 3 survey contents

Six parts :

- ❖ **Part A:** attitudes, lifestyle, values/beliefs
 - ❖ **Part B:** current baseline work and commute patterns
 - ❖ **Part C:** permanent changes made to work/commute patterns since spring 2008
 - ❖ **Part D:** temporary changes made to work/commute patterns during summer 2008
 - ❖ **Part E:** desirability of sustainable commute actions, and barriers to them
 - ❖ **Part F:** sociodemographic characteristics
-

Some preliminary results

- ❖ 41.6% indicated making a permanent change to their commute compared to spring 2008, but of those,
 - ❖ 66.3% said the Fix had nothing to do with it
 - ❖ 24.3% said the Fix was one factor among others
 - ❖ 9.4% said the Fix was the most important reason

Nature of the changes made

“Good” changes

- 6.3% commute fewer days
- 5.7% drive alone less
- 6.1% car/vanpool more
- 1.0% have more people in the vehicle
- 8.3% use transit more
- 1.2% walk more
- 4.0% bike more

“Bad” changes

- 4.8% commute more days
- 8.3% drive alone more
- 1.9% car/vanpool less
- 0.4% have fewer people in the vehicle
- 3.4% use transit less
- 0.6% walk less
- 3.0% bike less

15.8% commute at different times

Need to see whether the Fix tended to result in the “good” changes!

Was the net outcome of the Fix per se “good”, neutral, or “bad”?

Conclusions

- ❖ **Passive impacts:** do not appear excessive; however, women more likely to be affected by the Fix (positively & negatively);
 - ❖ **Active changes:**
 - The easiest options (**avoiding rush hour**, 48%, & **changing route**, 44%) are the most common responses
 - About 5.6% of eligible respondents increased **telecommuting**
 - 3.1% increased their use of **compressed work schedules**
 - 3.1% increased their use of **vacation days**
 - 7.8% of the eligible sample made **commute mode** changes:
 - 5.4% increased transit
 - 2.5% increased walking/biking
 - 1.4% increased car/vanpooling
 - 0.6% increased driving alone
 - Altogether, 60.0% of eligible respondents made **at least one** of these active changes to their commute.
-

Conclusions (cont.)

❖ Active changes (cont.):

- Women **slightly more likely** to alter mode choices than men;
- Women **more likely** to increase transit and car/vanpool use than men, and **less likely** to increase bicycling or walking than men;
- Overall, women were more likely to make at least one change than men were.

Still to come

- Further analysis of Wave 3 data, including modeling the propensity to make a permanent change
- Completion of “final” report by March

With additional funding, we'd...

- ❖ Analyze behavioral transitions between Wave 1 and Wave 2 (linked cases only)
 - ❖ Learn more about dynamic adjustment as a lengthy project progresses – what kinds of people change over time, in which ways?
 - ❖ Link Wave 1 & 2 cases to their Wave 3 counterparts, to
 - ❖ Link more currently unlinked Wave 1 & 2 cases
 - ❖ See how attitudes influenced during-the-Fix choices
 - ❖ Examine change persistence more reliably (using actual during-Fix behavior, not behavior recalled 6+ months later)
 - ❖ Distinguish: what % of those doing something different “now” are doing it because of the Fix? (~4%), versus what % of those who did something because of the Fix are still doing it “now”? (could be larger, or smaller, than 4%)
-

With additional funding, we'd ... (cont'd)

- ❖ Model other behavioral changes beyond increased transit use (e.g. who increased walking/biking to work?)
 - ❖ Incorporate geographical information into the analysis
 - ❖ We have intersections near home and work
 - ❖ What role do residential and work neighborhood land use patterns play in baseline mode choices, propensity to change?
 - ❖ How do attitudes vary spatially?
 - ❖ Compare the travel behavior of attitudinally/geographically matched versus mismatched respondents
-

Questions?



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