

# The Gemini Project to Redesign the CE Surveys

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## **Gemini Design Team**

Office of Prices and Living Conditions  
Division of Consumer Expenditure Survey  
July 16, 2013



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# Outline

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1. Gemini Project
  - a. Background
  - b. Redesign Proposal
  - c. Current Design vs. Proposed Design
  - d. Road Ahead
  - e. Questions/Discussion



# BACKGROUND



# Motivation

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- Evidence of measurement error
- Changes in technology and spending behaviors
- Need for greater operational flexibility

# Objectives

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- Verifiable reduction in measurement error, with a particular focus on underreporting
- Reduction in burden

## OPLC Requirements

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- Minimum set of expenditure/non-expenditure data elements from each Consumer Unit
- Annual expenditure estimates of total household spending
- Month of expenditure(s) for each expenditure category
- Data collected at a minimum of two points in time, one year apart



## Key Proposal Inputs

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CE relied on several sources for proposal inputs:

- Expert panels
- External discussion events
- Ongoing research on key topics
- National Academies' Committee on National Statistics (CNSTAT)
- Westat independent proposal
- Census staff and Field Representative (FR) input



## Design Features Recommended by CNSTAT

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- One sample design
- Flexible recall periods & interview structure
- Modular design with a core survey
- Increased use of technology, especially to encourage 'in the moment' reporting
- Increased use of records
- Reduced proxy reporting
- Mixed mode data collection
- Large incentives





## Design Features Recommended by Westat

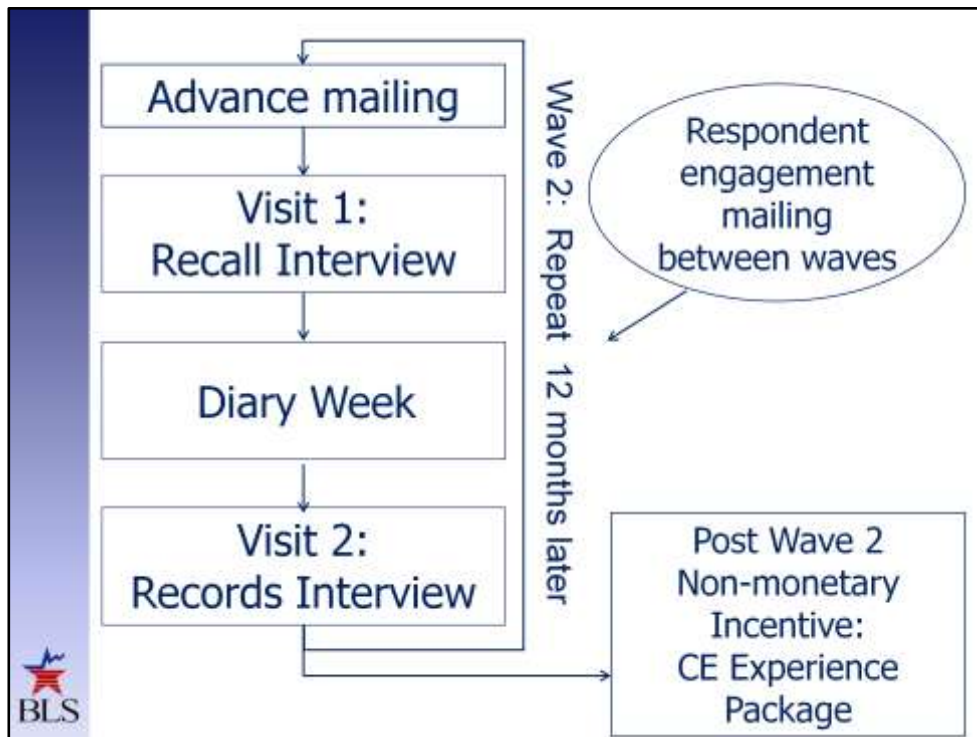
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- One sample design
- Two or three waves of data collection
- Individual diaries
- Use of a web-based diary to allow respondents to enter data via their Smart Phone, tablet or home PC
- Monitoring of incoming diary data during reporting periods with potential interviewer interventions
- Increased use of records
- Use of respondent-level incentives



# DESIGN PROPOSAL





Pending further research:

- When the experience package will be sent
- Amount of Token cash in advance mailing

# WAVE 1



## Visit 1: Personal Interview



16

- Advance mailing with token cash incentive (\$2, pending research)
- Personal interview, similar to current structure with reduced content
- Time Goal: 45 minute average

## Visit 1: Recall-based expenditures



17

### Visit 1 content:

- Household roster
- Demographics
- Recall-based expenditures (3-month reference period)
  - items easily recalled such as appliances, vehicles, and doctor's visits
  - Infrequent purchases not likely collected in a one week diary
  - Items respondents would be able to report of other hh members (tuition, catered affairs)
- "Global" questions capturing at a more highly aggregated level what the Diary week will collect detail on

## Visit 1: Training



18

- 1) Train respondent (and other household members, if possible) to complete the web diary
- 2) Train respondent on what records/bills to collect for the following personal visit interview

## Visit 1: Incentive

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At the conclusion of Visit 1, the respondent will receive a household based incentive of \$20 debit card (despite picture)



# Diary Week

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21

- All HH members 15+ maintain individual electronic diary for 1 week
- Offer paper diary for those that prefer
- FR contacts as necessary based on centralized diary monitoring

# Diary: Content



22

Similar to current Diary: Open-ended to capture any expense during the week

Designed to best collect:

- smaller, more frequently purchased items
- Items more willing to report privately
- Items an proxy respondent would not know

## Diary Week: Incentive(s)



\$20 individual incentives for each eligible completed Diary.

## Visit 2: Personal Interview



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25

- Personal interview, with assistance from records gathered (as trained in Visit 1)
- Review of Diary
- Time Goal: 45 minute average

## Visit 2: Records-based expenditures



STATE BARBERS INC.				Savings Summary		
4000 INDEPENDENCE BLVD				4000 INDEPENDENCE BLVD		
MEMPHIS, TN 38117				MEMPHIS, TN 38117		
DATE	DESCRIPTION	DEBIT	CREDIT	BALANCE	DATE	BALANCE
01/01/01			1000.00	1000.00		1000.00
01/02/01	STATE BARBERS INC	10.00		990.00		990.00
01/03/01	STATE BARBERS INC	10.00		980.00		980.00
01/04/01	STATE BARBERS INC	10.00		970.00		970.00
01/05/01	STATE BARBERS INC	10.00		960.00		960.00
01/06/01	STATE BARBERS INC	10.00		950.00		950.00
01/07/01	STATE BARBERS INC	10.00		940.00		940.00
01/08/01	STATE BARBERS INC	10.00		930.00		930.00
01/09/01	STATE BARBERS INC	10.00		920.00		920.00
01/10/01	STATE BARBERS INC	10.00		910.00		910.00
01/11/01	STATE BARBERS INC	10.00		900.00		900.00
01/12/01	STATE BARBERS INC	10.00		890.00		890.00
01/13/01	STATE BARBERS INC	10.00		880.00		880.00
01/14/01	STATE BARBERS INC	10.00		870.00		870.00
01/15/01	STATE BARBERS INC	10.00		860.00		860.00
01/16/01	STATE BARBERS INC	10.00		850.00		850.00
01/17/01	STATE BARBERS INC	10.00		840.00		840.00
01/18/01	STATE BARBERS INC	10.00		830.00		830.00
01/19/01	STATE BARBERS INC	10.00		820.00		820.00
01/20/01	STATE BARBERS INC	10.00		810.00		810.00
01/21/01	STATE BARBERS INC	10.00		800.00		800.00
01/22/01	STATE BARBERS INC	10.00		790.00		790.00
01/23/01	STATE BARBERS INC	10.00		780.00		780.00
01/24/01	STATE BARBERS INC	10.00		770.00		770.00
01/25/01	STATE BARBERS INC	10.00		760.00		760.00
01/26/01	STATE BARBERS INC	10.00		750.00		750.00
01/27/01	STATE BARBERS INC	10.00		740.00		740.00
01/28/01	STATE BARBERS INC	10.00		730.00		730.00
01/29/01	STATE BARBERS INC	10.00		720.00		720.00
01/30/01	STATE BARBERS INC	10.00		710.00		710.00
01/31/01	STATE BARBERS INC	10.00		700.00		700.00
02/01/01	STATE BARBERS INC	10.00		690.00		690.00
02/02/01	STATE BARBERS INC	10.00		680.00		680.00
02/03/01	STATE BARBERS INC	10.00		670.00		670.00
02/04/01	STATE BARBERS INC	10.00		660.00		660.00
02/05/01	STATE BARBERS INC	10.00		650.00		650.00
02/06/01	STATE BARBERS INC	10.00		640.00		640.00
02/07/01	STATE BARBERS INC	10.00		630.00		630.00
02/08/01	STATE BARBERS INC	10.00		620.00		620.00
02/09/01	STATE BARBERS INC	10.00		610.00		610.00
02/10/01	STATE BARBERS INC	10.00		600.00		600.00
02/11/01	STATE BARBERS INC	10.00		590.00		590.00
02/12/01	STATE BARBERS INC	10.00		580.00		580.00
02/13/01	STATE BARBERS INC	10.00		570.00		570.00
02/14/01	STATE BARBERS INC	10.00		560.00		560.00
02/15/01	STATE BARBERS INC	10.00		550.00		550.00
02/16/01	STATE BARBERS INC	10.00		540.00		540.00
02/17/01	STATE BARBERS INC	10.00		530.00		530.00
02/18/01	STATE BARBERS INC	10.00		520.00		520.00
02/19/01	STATE BARBERS INC	10.00		510.00		510.00
02/20/01	STATE BARBERS INC	10.00		500.00		500.00
02/21/01	STATE BARBERS INC	10.00		490.00		490.00
02/22/01	STATE BARBERS INC	10.00		480.00		480.00
02/23/01	STATE BARBERS INC	10.00		470.00		470.00
02/24/01	STATE BARBERS INC	10.00		460.00		460.00
02/25/01	STATE BARBERS INC	10.00		450.00		450.00
02/26/01	STATE BARBERS INC	10.00		440.00		440.00
02/27/01	STATE BARBERS INC	10.00		430.00		430.00
02/28/01	STATE BARBERS INC	10.00		420.00		420.00
02/29/01	STATE BARBERS INC	10.00		410.00		410.00
03/01/01	STATE BARBERS INC	10.00		400.00		400.00
03/02/01	STATE BARBERS INC	10.00		390.00		390.00
03/03/01	STATE BARBERS INC	10.00		380.00		380.00
03/04/01	STATE BARBERS INC	10.00		370.00		370.00
03/05/01	STATE BARBERS INC	10.00		360.00		360.00
03/06/01	STATE BARBERS INC	10.00		350.00		350.00
03/07/01	STATE BARBERS INC	10.00		340.00		340.00
03/08/01	STATE BARBERS INC	10.00		330.00		330.00
03/09/01	STATE BARBERS INC	10.00		320.00		320.00
03/10/01	STATE BARBERS INC	10.00		310.00		310.00
03/11/01	STATE BARBERS INC	10.00		300.00		300.00
03/12/01	STATE BARBERS INC	10.00		290.00		290.00
03/13/01	STATE BARBERS INC	10.00		280.00		280.00
03/14/01	STATE BARBERS INC	10.00		270.00		270.00
03/15/01	STATE BARBERS INC	10.00		260.00		260.00
03/16/01	STATE BARBERS INC	10.00		250.00		250.00
03/17/01	STATE BARBERS INC	10.00		240.00		240.00
03/18/01	STATE BARBERS INC	10.00		230.00		230.00
03/19/01	STATE BARBERS INC	10.00		220.00		220.00
03/20/01	STATE BARBERS INC	10.00		210.00		210.00
03/21/01	STATE BARBERS INC	10.00		200.00		200.00
03/22/01	STATE BARBERS INC	10.00		190.00		190.00
03/23/01	STATE BARBERS INC	10.00		180.00		180.00
03/24/01	STATE BARBERS INC	10.00		170.00		170.00
03/25/01	STATE BARBERS INC	10.00		160.00		160.00
03/26/01	STATE BARBERS INC	10.00		150.00		150.00
03/27/01	STATE BARBERS INC	10.00		140.00		140.00
03/28/01	STATE BARBERS INC	10.00		130.00		130.00
03/29/01	STATE BARBERS INC	10.00		120.00		120.00
03/30/01	STATE BARBERS INC	10.00		110.00		110.00
03/31/01	STATE BARBERS INC	10.00		100.00		100.00



26

Visit 1 content:

- Review of Diary week
- Records-based expenditures (3-month reference period)
- Items that respondents likely do not accurately know but could easily obtain from records
- Items that respondents may know but may be more accurately reported using records

## Visit 2: Incentive



At the conclusion of Visit 2, the respondent will receive a household based incentive of \$20 debit card (despite picture) if no records are used, \$30 if records are used.

# WAVE 2



## Design Overview: Wave 2



30

12 months later: repeat Wave 1

Visit 1

Diary Week

Visit 2

Post-wave 2 CE “experience package” as non-monetary incentive, for example:

Charts displaying HH wave 1 expenditures vs. national average

Information sheet listing helpful government websites

(future decision on whether to do this between waves or post-wave 2)



## Design Overview: Major Issues Addressed

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1. Incentives → addresses respondent motivation
2. Technology → encourages real-time data capture
3. Individual diaries → reduces proxy reporting
4. Shortened interview length, reduced survey content, and increased record use → improve data quality

## Design Overview: Future Decisions

Topics to be addressed during the redesign research development process:

- Mobile device application type
- Use of records as data input
- Acceptance of annotated grocery receipts
- Incentive amounts and structure
- Exact survey content
- Government provided technology
- Length of Wave 1 and Wave 2 visits
- When the experience package will be sent
- Inclusion of TPOPS-supporting outlets questions

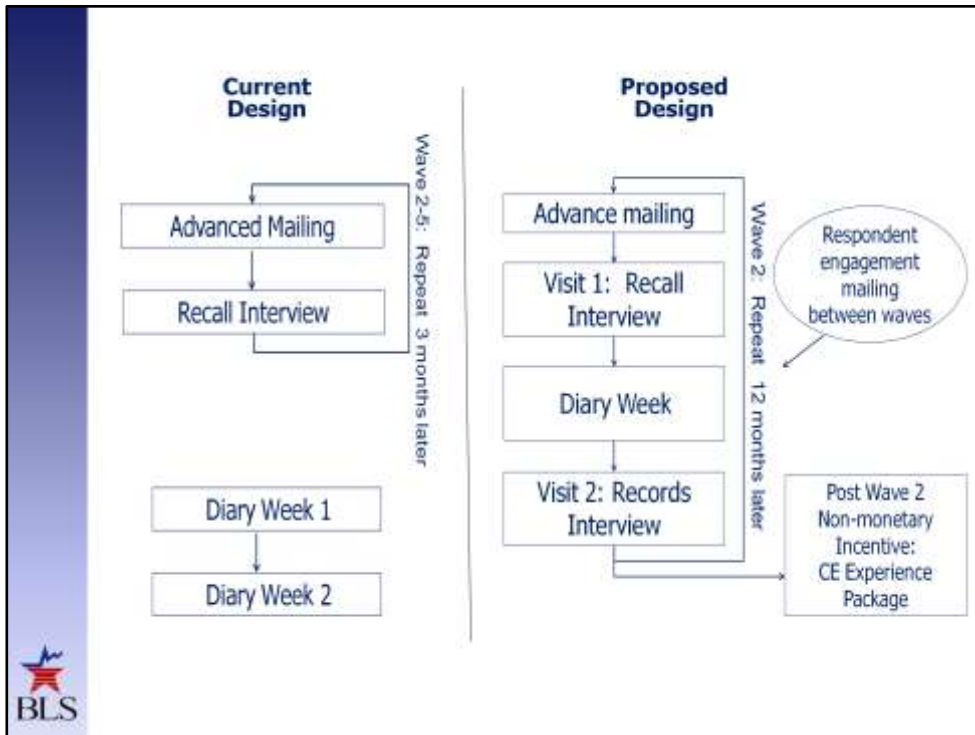


32

- Mobile device application type – Whether to use a mobile-optimized web survey or a native application (app)
- Use of records as data input – capture and code information directly from records and input that information into the diary and/or interview
- Acceptance of annotated grocery receipts (in lieu of reporting in diary)
- Incentive amounts and structure – logistical issues, effectiveness of all planned incentives
- Exact survey content – Visit 1 vs. Visit 2 vs. Diary, Global questions, household diary
- Government provided technology – costs/risks, logistical issues
- Length of Wave 1 and Wave 2 visits – evaluate if goal of 45 minutes is realistic
- When the experience package will be sent
- Inclusion of TPOPS-supporting outlets questions – An option to add questions required to replace CPI's Telephone point of purchase survey, includes store name, location, and price.

# **CURRENT DESIGN VS. PROPOSED DESIGN**





## Current vs. Proposed: Sample Design

Current	Proposed
Two independent Samples (Diary and Interview)	One Integrated Sample (Interview, with Diary keeping component)

### Advantage:

- Reduced costs of maintaining two samples
- Diary level detail for all CUs

### Disadvantage:

- Potential burden for household completing both the Interviews and Diary



## Current vs. Proposed: Interview

Current	Proposed
Single Interview for large, recurring expenditures	2 interviews: Recall based and Records based

### Advantage:

- Ease respondent burden with half of typical content of the current interview
- Better quality data for records focus

### Disadvantage:

- Rely on completion of 2<sup>nd</sup> interview for complete spending from one household



## Current vs. Proposed: Diary

Current	Proposed
Two one-week open ended paper diaries	Electronic one week diary with paper back-up

### Advantage:

- Electronic diary – more flexible and easier for respondent
- Electronic diary – in the moment reporting
- Respondent uses mode most comfortable with (Electronic or Paper)

### Disadvantage:

- Design of electronic diary does not meet respondent expectations



## Current vs. Proposed: Diary

Current	Proposed
Single paper diary per household	Individual diaries for all households 15 and over.

### Advantage:

- Reduce error due to proxy reporting
- Spreads burden across household members, instead of on an individual respondent
- Increased salience among participants

### Disadvantage:

- Requiring all household members to complete diary could reduce response.





## Current vs. Proposed: Incentives

Current	Proposed
No Incentives	Performance-based incentives at the individual and household level

### Advantage:

- Increase response rates
- Increase respondent motivation/Improved data quality
- Fewer contact attempts needed to complete interview (saves money)

### Disadvantage:

- Costly



39

- \* The field test we did showed fewer contact attempts were needed which saves money,
- \* It also showed positive (but not significant) indications of improved data quality.

# Current vs. Proposed: Expenditure Categories

Current	Proposed
Detailed UCC level	More highly aggregated

## Advantage:

- Fewer questions – reduced burden and interview length

## Disadvantage:

- Less detailed expenditure data
- CPI will need to analyze their process to adjust to less detail



## Current vs. Proposed: Waves

Current	Proposed
4 waves - 12 consecutive months of expenditures per CU, each wave treated independently	2 waves - 3 months of expenditures, set 12 months apart, each wave treated independently

### Advantage:

- Improvement of annual variance estimates
- Reduced measurement error resulting from conditioned underreporting
- Analysis of 12-month change in expenditures/income

### Disadvantage:

- FR may lose rapport with respondent between waves set far apart
- Some users need one year of expenditures and income for consumption analysis



## Development & Implementation Timeline

2013-14

- ▶ Approved redesign proposal released
- ▶ User impact of proposal
- ▶ Develop roadmap

2014-?

- ▶ Conduct testing & evaluation
- ▶ Develop, pilot, & implement new design



42

The end point of when the redesign will be complete depends on the availability of funding.

Next slides elaborate testing/evaluation/development/piloting steps.

## Testing & Evaluation

- Proof-of-Concept test
- Visit 1 Recall Interview Test
  - ▶ Recall interview diary placement procedures
  - ▶ Recall interview length
  - ▶ Recall interview global questions
  - ▶ Effectiveness of token incentive & interview incentive
- Visit 2 Records Interview Test
  - ▶ Records interview procedures
  - ▶ Records interview length
  - ▶ Records interview global questions
  - ▶ Effectiveness of interview incentive



43

Proof-of-concept test to determine if the main ideas behind the proposal are possible (one-sample design, etc)

## Testing & Evaluation, cntd.

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- Finalized Web and App Diary Test
  - ▶ Placement procedures, usability, and reporting for finalized web and app web diary
  - ▶ FR monitoring & respondent feedback procedures
- Pilot Test
  - ▶ Large sample size dress rehearsal of full design
  - ▶ Visit 1 recall interview, records training, diary placement
  - ▶ Diary keeping
  - ▶ Visit 2 records interview and diary pick-up
- Development, Training, & Implementation



## **Design Team (past and present)**

- Kathy Downey, formerly Bureau of Labor Statistics
- Jennifer Edgar, Bureau of Labor Statistics
- John Gloster, U.S. Census Bureau
- Dawn V. Nelson, U.S. Census Bureau
- Laura Paszkiewicz, Bureau of Labor Statistics
- Adam Safir, Bureau of Labor Statistics



## Questions/Discussion

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- Positive impacts on research?
- Negative impacts on your research?
- Specific design changes:
  - ▶ 12-month change instead of 12 months consecutive data (assuming no attrition)
  - ▶ Fewer, more aggregated expenditure categories
  - ▶ Diary reference period not aligned with Visit 1 and Visit 2 reference periods
- Information/training you need prior to implementation
- Amount of lead time needed prior to implementation





# Contact Information

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