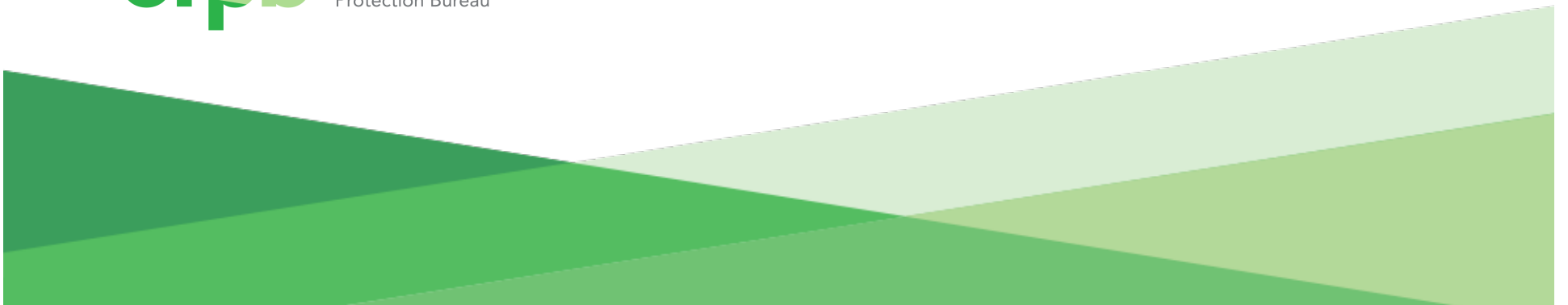


Making API Docs Work

API Usability and getting people to contribute to open source @CFPB



Consumer Financial
Protection Bureau



How this project came about.

T&I wanted to use the release of HMDA data as an opportunity to engage the developer community. Understanding that HMDA data could get complicated, Clinton Dreisbach wrote documentation for the API. Desiree Garcia and Mehgan Iulo were asked to make it look presentable.

The result

intuitive
nav



CFPB Open Tech

cfpb Consumer Financial Protection Bureau

HMDA API docs

Build your own tools using our API to access HMDA public data.

- Overview
- API basics
- API calls
- Query language
- Field reference
- Contribute

Overview

Each year thousands of banks and other financial institutions report data about mortgages to the public as part of the [Home Mortgage Disclosure Act \(HMDA\)](#). This data is important because:

- It helps show whether lenders are serving the housing needs of their communities;
- It gives public officials insight that helps them make informed decisions about policies; and
- It sheds light on lending patterns that could be discriminatory

The CFPB provides every year of the Loan Application Register (LAR) data since 2007. That adds up to about 15 to 20 million records every year, and we think that you could build something really cool with it.

GET STARTED


We built the API to be as self-documenting as possible, but if you find yourself overwhelmed, we organized this site into four major areas.

- [API basics](#) introduces you to the operations offered by the API.
- [API calls](#) gives you a hands-on experience of those operations with an interactive console.
- [Query language](#) contains a comprehensive listing of all the API's types, functions, and enumerations.
- [Field reference](#) lists and describes the type of information reported in the LAR.

THE HMDA API AND QU

[HMDA](#) is the CFPB's first dataset to publish using [Qu](#), an in-progress data platform created to serve public data.

[Qu](#) is the first CFPB project built from the beginning on [GitHub](#), too. If you think you can make the API better—or just want to take a look under the hood—check it out, and learn about how you can host your own datasets or contribute to the project.



Qu
The open source software that runs the platform

Not interested in programming? You can still get the data! Visit the [explore the data](#) section of our HMDA site, where you can create [custom data sets](#) for download.

[consumerfinance.gov](#)
[github.com/cfpb](#)
[Work with us](#)

OPEN SOURCE

As a work of the United States Government, source code released by the CFPB is in the public domain by default within the United States. [View our full source code policy.](#)


context

quick
start

github
github

Hands-on

CFPB Open Tech

 Consumer Financial Protection Bureau

HMDA API docs

Build your own tools using our API to access HMDA public data.

Overview

API basics

API calls

Query language

Field reference

Contribute

API calls

Explore the API here hands-on. Need a little help? Read our [API basics](#) to learn about datasets, concepts, and slices.

data : Operations about datasets

[List operations](#) | [Expand operations](#) | [Raw code](#)

GET

/data

Get a list of all datasets.

hmda : Operations about LAR data

[List operations](#) | [Expand operations](#) | [Raw code](#)

GET

/data/hmda/concept/{concept}

Get information about a particular concept in this dataset.

GET

/data/hmda/slice/{slice}

Query a slice in this dataset.

GET

/data/hmda/slice/{slice}/metadata

Get the metadata for a slice in this dataset.

READY TO DIVE DEEPER?


See all functions and enumerations in [Query language](#), or look up all the variables and values found in LAR data at [Field reference](#). To learn more about what LAR data is and how it is collected, [visit our HMDA website](#).

[consumerfinance.gov](#)
[github.com/cfpb](#)
[Work with us](#)
[Contact us](#)

OPEN SOURCE

As a work of the United States Government, source code released by the CFPB is in the public domain by default within the United States. [View our full source code policy.](#)

Swagger

 Consumer Financial Protection Bureau

Concepts provide examples

Introducing something new and unique to HMDA API and reinforcing it with a real example.

SLICES

Think of slices as tables in a relational database. Every dataset has many slices representing different views of it, which you can use to [construct advanced queries](#). The endpoint for every slice is `/data/{dataset-name}/{slice-name}`.

You can even request a slice in HTML, XML, JSON, JSONP, or CSV. Just append the filename extension to the endpoint like so:

```
/data/{dataset-name}/{slice-name.extension}
```

[Try it out >](#)

Making the basics relevant right away

PUTTING IT ALL TOGETHER

Every year, the Federal Reserve finds interesting trends in HMDA data and publishes them in a report. Let's say you want to replicate some of their [2012 highlights](#) in JSON.

To compare refinances and home purchases in 2012, you would send the following query to the API:

```
https://api.consumerfinance.gov/data/hmda/slice/hmda_lar.json?
#!/property_type=1,2&action_taken=1&select=as_of_year,loan_purpose_name,count&section=
summary
```

[Try it out >](#)



Consumer Financial
Protection Bureau

Can be harder or simpler

Making the entire thing
available to play with

Always allow going back

API calls

Explore the API here hands-on. Need a little help? Read our [API basics](#) to learn about datasets, concepts, and slices.

Always allow making it harder

READY TO DIVE DEEPER?

See all functions and enumerations in [Query language](#), or look up all the variables and values found in LAR data at [Field reference](#). To learn more about what LAR data is and how it is collected, [visit our HMDA website](#).

Level of detail and focus

Skimming over the details helps with the big picture and prevents cognitive overload

MORE ON \$WHERE

This clause supports a mini-language for writing queries. It's a subset of SQL `WHERE` clauses, with the addition of function support. A `$where` clause is made up of one or more comparisons, joined by boolean operators.

[Show a list of possible comparisons](#) +

[Show a list of possible boolean operators](#) +

MORE ON \$WHERE

This clause supports a mini-language for writing queries. It's a subset of SQL `WHERE` clauses, with the addition of function support. A `$where` clause is made up of one or more comparisons, joined by boolean operators.

[Show a list of possible comparisons](#) +

[Hide a list of possible boolean operators](#) -

Operator	What it means	Example
<code>AND</code>	logical AND of two comparisons	<code>state = "Alaska" AND age > 18</code>
<code>OR</code>	logical OR of two comparisons	<code>state = "Alaska" OR state = "Hawaii"</code>
<code>NOT</code>	negation of a comparison	<code>NOT (state = "Alaska" OR state = "Hawaii")</code>
<code>()</code>	grouping or order of operations	<code>(state = "Alaska" OR state = "Hawaii") AND age > 18</code>

Without losing those who really need it



Consumer Financial
Protection Bureau

Win!

So we forget about it!

18f

API usability

It sounded so much cooler than it was

- 6 people from private industry invited to do a usability study on 3 government API documentation sites
- Companies:
 - GovTribe
 - API Academy
 - iStrategyLabs
- Sites: HMDA Docs was one of them, SAM API, USAjobs
- Note that SAM API kinda took our work and changed the colors on them
- Study was a think aloud free-association thing for 5 minutes plus ?s
- CFPB docs were perceived as an ideal

Overall Findings

The good

- “It’s so easy to use”
- “wonderfully laid out and organized”
- “lots of just in time moments”
- “great to see embedded calls”
- “[that HMDA site uses the API] that’s awesome”

Cool

The bad

- “It looks like a show-off science project”
- “sounds like terms and conditions”
- “can’t find any definitions”
- “congress stuff”
- business plans, stagnant

but I would’t use it.

Following up with a thank you note

Committed in front of the industry visitors that we would make changes to improve their experience.

1. Fixing what was freezing
2. Adding more examples (
3. Trimming the fat on gov-speak (approachable)

The highest hope being that they would check back and contribute this time.

The worst case being that we would do nothing and they'd lose trust; another instance of "more talking no doing"

Why usability and user experience is an afterthought

My take:

- The dev community represents the ultimate power user.
- Usability is perceived as a non-issue because we know all the workarounds
- There might even be some triumph to figuring out something that is disorganized, tricky, and unintuitive.

This isn't the real problem.

The problem is not one of ability and skill.
It's one of motivation.

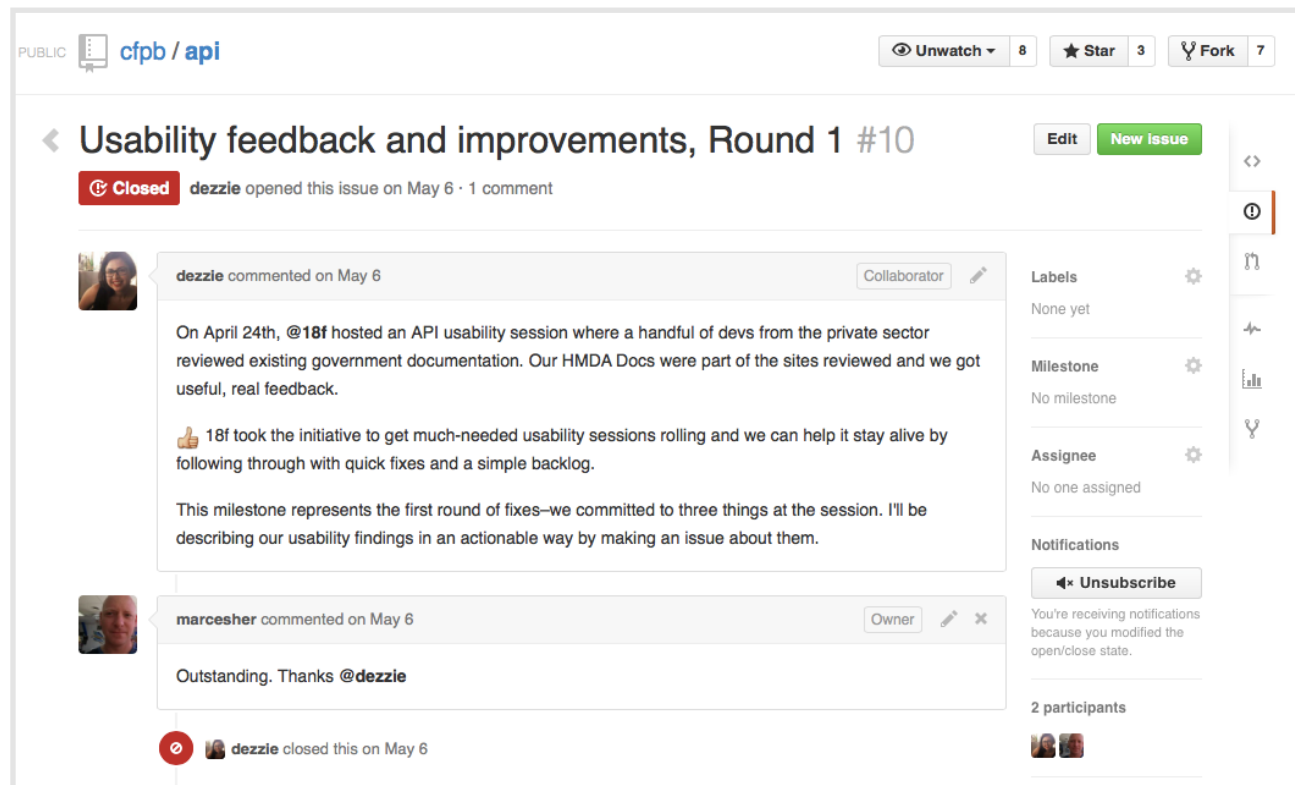
Open source success and motivation

- People have a perception of what government-produced software is like, it's not attractive, and it puts us at a disadvantage.
- If we invite the dev community to contribute, we have to work extra hard
- We have to pitch it in such a way that gives the promise of, “this will be different”
- But it can't stop there—once they arrive at our documentation or other content, it needs to continue being different
- This was the strategy for the first version of the docs. It made them successful but also posed the biggest challenge:

Responding to usability findings using Github

Why use Github?

1. use of a place where devs already are means we're catering to them not us
2. shows that our repos are not stagnant after successful launch
3. if one of us can't implement changes, there are ways for others to do it



Using Github to file usability issues

User feedback → Open Github Issue

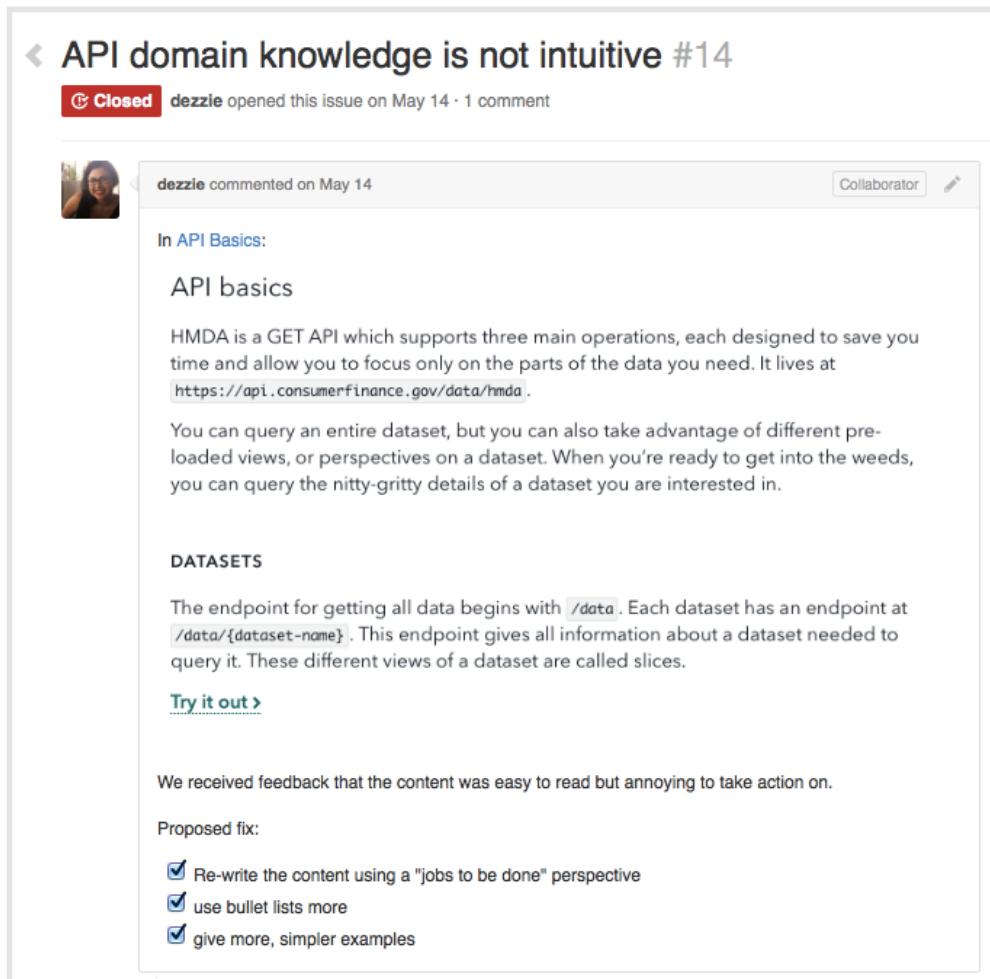
Describe the problem using UX or

usability tone

Show screenshots if applicable

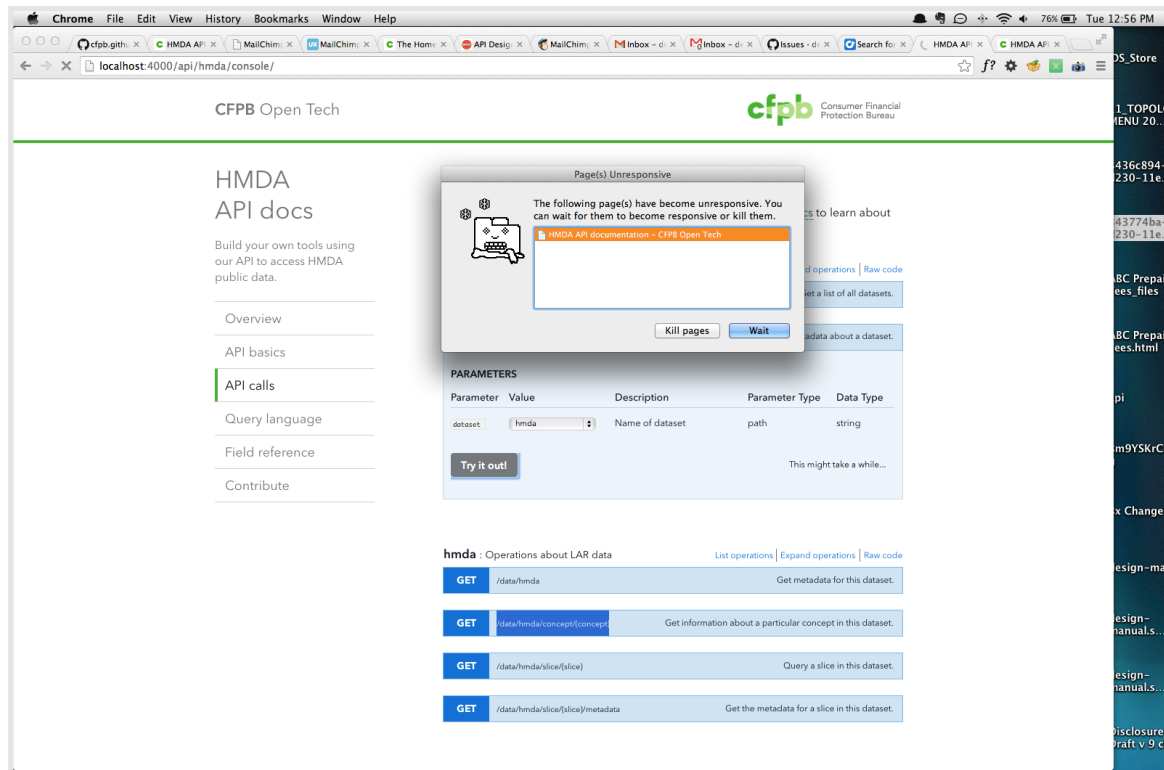
Propose a solution with screenshots

Make the fixes needed actionable steps




Easy stuff

Interaction improvements: crashy



Interaction improvements: crashy

CFPB Open Tech

 Consumer Financial Protection Bureau

HMDA API docs

Build your own tools using our API to access HMDA public data.

- Overview
- API basics
- API calls**
- Query language
- Field reference
- Contribute

API calls

Explore the API here hands-on. Need a little help? Read our [API basics](#) to learn about datasets, concepts, and slices.

data : Operations about datasets [List operations](#) | [Expand operations](#) | [Raw code](#)

GET /data Get a list of all datasets.

hmda : Operations about LAR data [List operations](#) | [Expand operations](#) | [Raw code](#)

GET /data/hmda/concept/{concept} Get information about a particular concept in this dataset.

GET /data/hmda/slice/{slice} Query a slice in this dataset.

GET /data/hmda/slice/{slice}/metadata Get the metadata for a slice in this dataset.

READY TO DIVE DEEPER?

See all functions and enumerations in [Query language](#), or look up all the variables and values found in LAR data at [Field reference](#). To learn more about what LAR data is and how it is collected, [visit our HMDA website](#).

Interaction improvements: fields

data : Operations about datasets [List operations](#) | [Expand operations](#) | [Raw code](#)

GET /data Get a list of all datasets.

[Try it out!](#) [\[Hide Response \]](#)

REQUEST URL

`https://api.consumerfinance.gov:443/data`
[Copy to clipboard](#)

RESPONSE BODY

```
{ "_embedded": { "datasets": [ { "_links": [ { "rel": "self", "href": "/data/hmda" } ] }
```

RESPONSE CODE

`200`

RESPONSE HEADERS

```
{"Content-Type": "application/json; charset=UTF-8"}
```

data : Operations about datasets [List operations](#) | [Expand operations](#) | [Raw code](#)

GET /data Get a list of all datasets.

[Try it out!](#) [\[Hide Response \]](#)

REQUEST URL

`https://api.consumerfinance.gov:443/data`

RESPONSE BODY

```
{
  "_embedded": {
    "datasets": [
      {
        "_links": [
          {
            "rel": "self",
            "href": "/data/hmda"
          }
        ],
        "swagger_description": "LAR data",
        "description": "Home Mortgage Disclosure Act Data for the years 2007-2012.",
        "name": "2007-2012 HMDA LAR",
        "url": "http://www.ffiec.gov/hmda/hmdaproducts.htm"
      }
    ]
  },
  "_links": [
    {
      "rel": "self",
      "href": "/data"
    }
  ]
}
```

RESPONSE CODE

`200`

RESPONSE HEADERS

```
{"Content-Type": "application/json; charset=UTF-8"}
```

Interaction improvements: nav

HMDA API docs

Build your own tools using our API to access HMDA public data.

Overview

API basics

API calls

Query language

Field reference

Contribute

HMDA API docs

Build your own tools with access to millions of public data records about mortgage loan applications.

Overview

API basics

API calls

API fields

Query language

Contribute

Trickier stuff

Content improvements: basics

API basics

HMDA is a GET API which supports three main operations, each designed to save you time and allow you to focus only on the parts of the data you need. It lives at `https://api.consumerfinance.gov/data/hmda`.

You can query an entire dataset, but you can also take advantage of different pre-loaded views, or perspectives on a dataset. When you're ready to get into the weeds, you can query the nitty-gritty details of a dataset you are interested in.

DATASETS

The endpoint for getting all data begins with `/data/`. Each dataset has its own endpoint `/data/{dataset-name}`. This endpoint gives all information about a dataset. These different views of a dataset are called slices.

[Try it out >](#)

API basics

HMDA is a GET API that lives at `https://api.consumerfinance.gov/data/hmda`.

- You can query the entire **dataset**.
- You can query **slices**, which are pre-loaded views of data we think are interesting.
- You can query **concepts**, which describe types of information found in the dataset.

DATASETS

The endpoint for querying all data begins with `/data/`.

[Try it out >](#)

Endpoint	What it does
<code>/data/{dataset-name}</code>	Gives all information about a dataset
<code>/data/hmda</code>	Gives mortgage lending data from 2007-2012.

Content improvements: relevance

To compare refinances and home purchases in 2012, you would send the following query to the API:

```
https://api.consumerfinance.gov/data/hmda/slice/hmda_lar.json?
#!/property_type=1,2&action_taken=1&select=as_of_year,loan_purpose_name,count&section=
summary
```

[Try it out >](#)

To see changes in the FHA loan market for 2012, to the API:

```
https://api.consumerfinance.gov/data/hmda/slice/
#!/lien_status=1&loan_purpose=1&action_taken=1&
section=summary
```

[Try it out >](#)

Putting it all together

Use [API calls](#) to generate the request URLs for specific pieces of information, and try out these examples:

HOW MANY PEOPLE HAVE BOUGHT A HOUSE IN YOUR NEIGHBORHOOD?

Fill in your [state](#) and [census tract](#):

```
https://api.consumerfinance.gov/data/hmda/slice/hmda_lar.json?
#!/as_of_year=2012&state_code-1={YOUR STATE CODE}&census_tract_number-1={YOUR CENSUS
TRACT}&property_type=1,2&owner_occupancy=1&action_taken=1&loan_purpose=1&lien_status=1
```

THE MOST COMMON LOAN DENIAL REASON FOR PEOPLE LIKE YOU

Try using your [metro area](#) and demographics like [sex](#), [race](#), [ethnicity](#), or income range.

```
https://api.consumerfinance.gov/data/hmda/slice/hmda_lar.json?
#!/as_of_year=2012&msamd-1={YOUR METRO
AREA}&property_type=1&owner_occupancy=1&loan_purpose=1&lien_status=1&applicant_sex=
{SEX}&applicant_race_1={RACE}&applicant_ethnicity={ETHNICITY}&applicant_income_000s-
min>{MIN INCOME}&applicant_income_000s-max<{MAX
INCOME}&select=denial_reason_name_1,count&section=summary
```

Content improvements: faster context

◀ A faster, easier way to give context about HMDA #30

🔓 Open

dezzie opened this issue 29 days ago · 0 comments



dezzie commented 29 days ago

We received feedback that developers did not find the places where we tried to provide that context were helpful.

- the language had "too much politics and not enough facts"
- the language read like a history lesson
- links to learning more led to esoteric documentation
- our link to the "What is HMDA?" video was broken. No one watched it.

Most devs are also not coming to the docs from the video.

Proposed fix:

- ☐ Let's give our HMDA video another chance. I thought it was the best way to introduce people to HMDA.



Consumer Financial
Protection Bureau

CFPB Open Tech



HMDA API docs

Build your own tools with access to millions of public data records about mortgage loan applications.

Overview

API basics

API calls

API fields

Query language

Contribute

The Home Mortgage Disclosure Act

In 2012, there were 18.7 million HMDA records from 7,400 financial institutions. This data is a view of the mortgage market, an important part of the American economy. CFPB is serving every year of this data since 2007, and we think that you could build something really cool with it.

What is HMDA?



what is
HMDA?



GET STARTED

HMDA API is self-documenting. This site is designed to get the developer community acquainted with the information contained in HMDA data itself.

- [API basics](#) explains the API's operations using real-data examples.
- [API calls](#) gives hands-on experience with the dataset using an interactive console.
- [API fields](#) lists and describes the type of information found in this dataset.

NOT A DEVELOPER?

Our [HMDA website](#) is a perfect example of how APIs can put public data to work in exciting, transparent new ways.

[Explore the data](#) uses this API to let you look for interesting trends and put together a custom dataset for download just using your browser-no fancy statistical software required.

The hard stuff

Content improvements: jargon

 **Avoiding acronyms and jargon #15**

 **Open** **dezzie** opened this issue on May 14 · 0 comments



dezzie commented on May 14

Collaborator 

HMDA, LAR...

slices, concepts...

...what are better ways to say this? Ways to say it once (because it's required), and do something where we never have to say them again?

“How do I know this stuff will be there in 5 years?”

The deal breaker for those who want to create serious work—the unknown cannot be accounted for in a business plan. Less talking and more doing—no activity on a project after launch is seen as abandoned.

How do we communicate our change process outside the Bureau?



Engage in a way that would make Picard proud

“API developers who want to build tools using the [API](#) can [browse the documentation](#)”

“Software developers should check out our [API](#) and [documentation](#).”

“...we encourage you to [contribute](#) to the project on GitHub”

“[Here are the docs](#) on that.”

Lessons learned

Devs are users too.

Not speaking to developers in the user research portion of the HMDA project is a homemade example of assuming that we know our user. API Documentation, likewise, is not for expert HMDA users.

Mortgage data is boring.

This is like promoting a MOOC on Latin grammar.

I ate my own dog food.

In order to empathize with developers, I had to see if I could learn and do using my own documentation.