# How is Equity Calculated when Adding or Reducing Transit Service?

The adopted Service Guidelines (Ordinance 19367) use equity as a factor when prioritizing transit routes for additions or reductions. An equity score is calculated for each bus stop and each route using the metrics described on the left. A hypothetical example, for Imaginary Route #IR, is on the right. The Service Guidelines criteria for additions or reductions to service are described below.

## Equity Metrics

### EQUITY PRIORITY AREA SCORE (EPAS)

**Scale:** 1-5 points      **Based on: Census block group surrounding each bus stop**

**Used for:** The EPAS forms the basis for the other two equity scores (the EPS and OIS). The EPAS is also used to prioritize areas for flexible services.

**Calculated by:** Each <u>bus stop</u> is assigned a score of 1-5 based on weighting the demographic data of the census block group it is in:

| | |
|---|---|
| Population that is non-white or Hispanic | 40% |
| Population living 200% below the federal poverty level | 30% |
| Population that is foreign-born | 10% |
| Limited-English speaking households | 10% |
| Population living with a disability | 10% |

A higher EPAS means a higher equity need.

### EQUITY PRIORITIZATION SCORE (EPS)

**Scale:** 0-10 points      **Based on: Each bus route**

**Used for:** The EPS is a used as a factor in identifying the service level target for each route, as well as its priority level for investment when adding service as part of the Service Guidelines' Priority #3 (Service Growth). The three factors used to prioritize service additions (equity, land use, and geographic value) are described below.

**Calculated by:** The EPS starts with the <u>average EPAS</u> for all stops on a bus route. This average is then ranked against all the averages from all other routes, and points of 0-10 are assigned to <u>each route</u>. The higher the EPS (average or points), the higher the equity need for that route.

### OPPORTUNITY INDEX SCORE (OIS)

**Scale:** 1-5 points      **Based on: Each bus route**

**Used for:** When transit service must be reduced, the OIS is used as the equity score when determining the reduction priority for a route. The factors used in prioritizing service reductions (productivity and equity) are described below.

**Calculated by:** The OIS starts as the <u>percentage of all EPAS bus stop scores of 5</u> for a given route. This percentage is then ranked against the percentage of EPAS 5-scores for all other routes, and points of 1-5 are assigned, dividing routes into quintiles. The higher the OIS, the higher the equity need for that route.

## How is service added?

The adopted Service Guidelines include three priorities to add service:
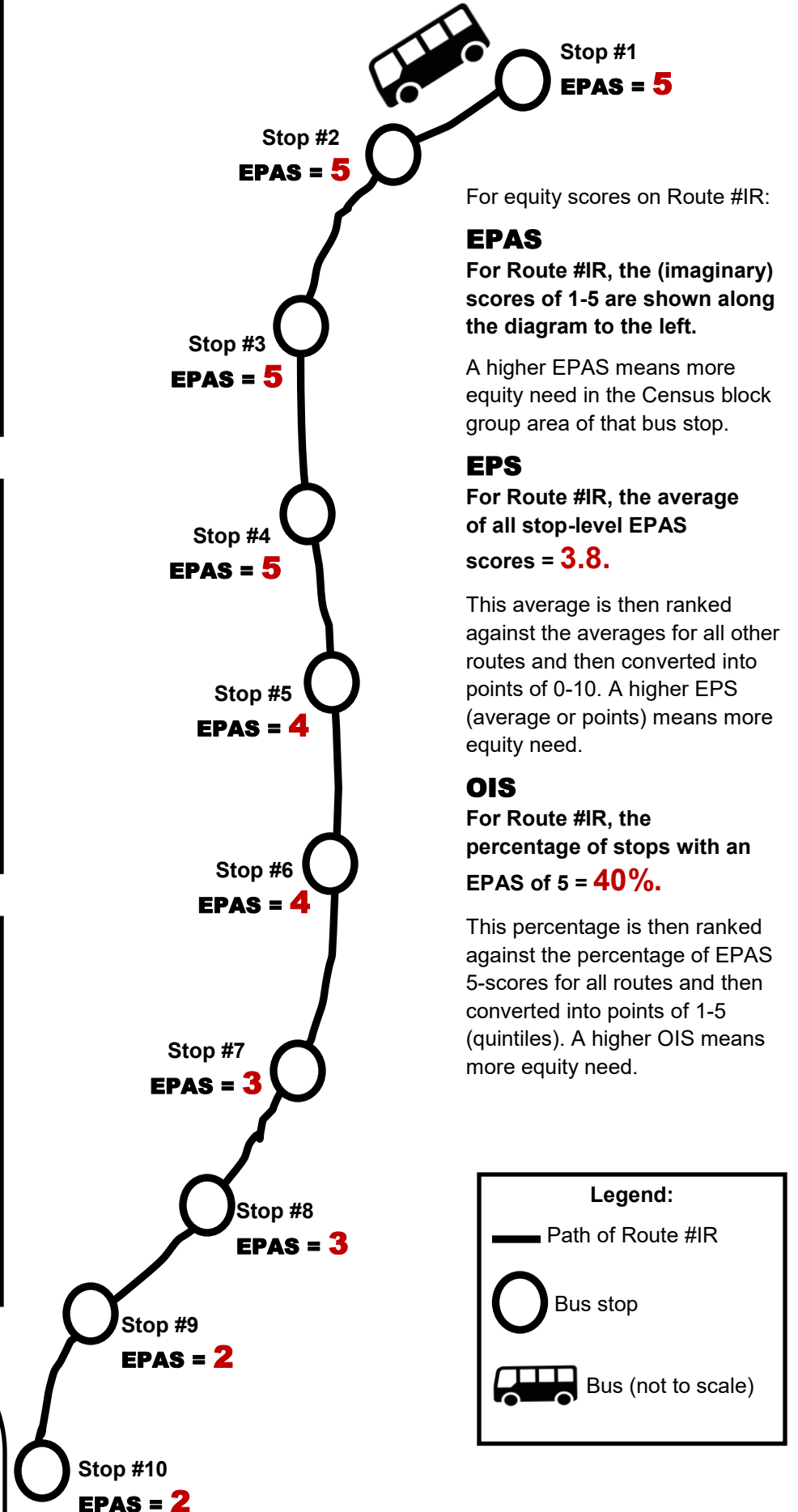
**Priority #1 = Reduce Crowding:** add service to overcrowded routes
**Priority #2 = Improve Reliability:** add service to routes that run late
**Priority #3 = Grow Service:** add service to meet target service levels

When service is added under Priority #3, the Service Guidelines use three factors to rank routes to establish <u>what</u> is the target for future service and <u>how</u> additional service should be added over time:

| Factor & Measures | Weighting <br> *(What is target)* | Prioritization <br> *(How reach target)* |
|---|---|---|
| **Equity** <br> EPS | 25% <br> (10 points) | **#1** |
| **Land Use** <br> * Households within 1/4 mile <br> * P&R stalls within 1/4 mile <br> * Jobs within 1/4 mile <br> * Low-income jobs within 1/4 mile <br> * Enrolled students at high school & college within 1/4 mile | 50% <br> (20 points) | **#2** |
| **Geographic Value** <br> * Connection between regional growth centers or activity centers or manufacturing/industrial centers | 25% <br> (10 points) | **#3** |

## Example: Imaginary Route #IR

This is a <u>hypothetical</u> of an imaginary route (#IR) with 10 stops, showing how the EPAS, EPS, and OIS scores are calculated.



**Stop #1**   EPAS = **5**
**Stop #2**   EPAS = **5**
**Stop #3**   EPAS = **5**
**Stop #4**   EPAS = **5**
**Stop #5**   EPAS = **4**
**Stop #6**   EPAS = **4**
**Stop #7**   EPAS = **3**
**Stop #8**   EPAS = **3**
**Stop #9**   EPAS = **2**
**Stop #10**   EPAS = **2**

For equity scores on Route #IR:

**EPAS**
**For Route #IR, the (imaginary) scores of 1-5 are shown along the diagram to the left.**

A higher EPAS means more equity need in the Census block group area of that bus stop.

**EPS**
**For Route #IR, the average of all stop-level EPAS scores = 3.8.**

This average is then ranked against the averages for all other routes and then converted into points of 0-10. A higher EPS (average or points) means more equity need.

**OIS**
**For Route #IR, the percentage of stops with an EPAS of 5 = 40%.**

This percentage is then ranked against the percentage of EPAS 5-scores for all routes and then converted into points of 1-5 (quintiles). A higher OIS means more equity need.

**Legend:**
— Path of Route #IR
◯ Bus stop
🚌 Bus (not to scale)

## How is service reduced?

The adopted Service Guidelines use productivity and equity to identify priorities for reduction when service must be reduced.

**Equity** uses the OIS. **Productivity** uses two measures:

- **Rides/platform hour** measures the number of riders who board a bus relative to the total number of hours the vehicle operates.

- **Passenger miles/platform mile** measures the total miles riders travel on a route relative to the total miles the vehicle operates.

There are six priorities for reduction (in order):

1. Routes in bottom 25% on 2 productivity measures, OIS 3 or less
2. Routes in bottom 25% on 2 productivity measures, OIS 4 or 5
3. Routes in bottom 25% on 1 productivity measure, OIS 3 or less
4. Routes in bottom 25% on 1 productivity measure, OIS 4 or 5
5. Routes in bottom 50% on 1-2 productivity measures, OIS 3 or less
6. Routes in bottom 50% on 1-2 productivity measures, OIS 4 or 5