

# Understanding Dimensional (DIM) Weight and Its Impact on Today's Shipping Environment.



## Section 1: What is DIM?

Most parcel shipping carriers have altered their method for calculating package weight and by extension the price the shipper pays. In 2014 major shipping carriers announced a dimensional weight pricing model—commonly called DIM—for air and ground parcel shipping services. For several years carriers have charged shippers the greater amount between actual weight and DIM weight. The new rules for DIM weight have become more complex creating financial consequences for shippers. This white paper seeks to clarify the facts about the DIM weight shipping environment, and provide practical cost management recommendations to gain a competitive edge.



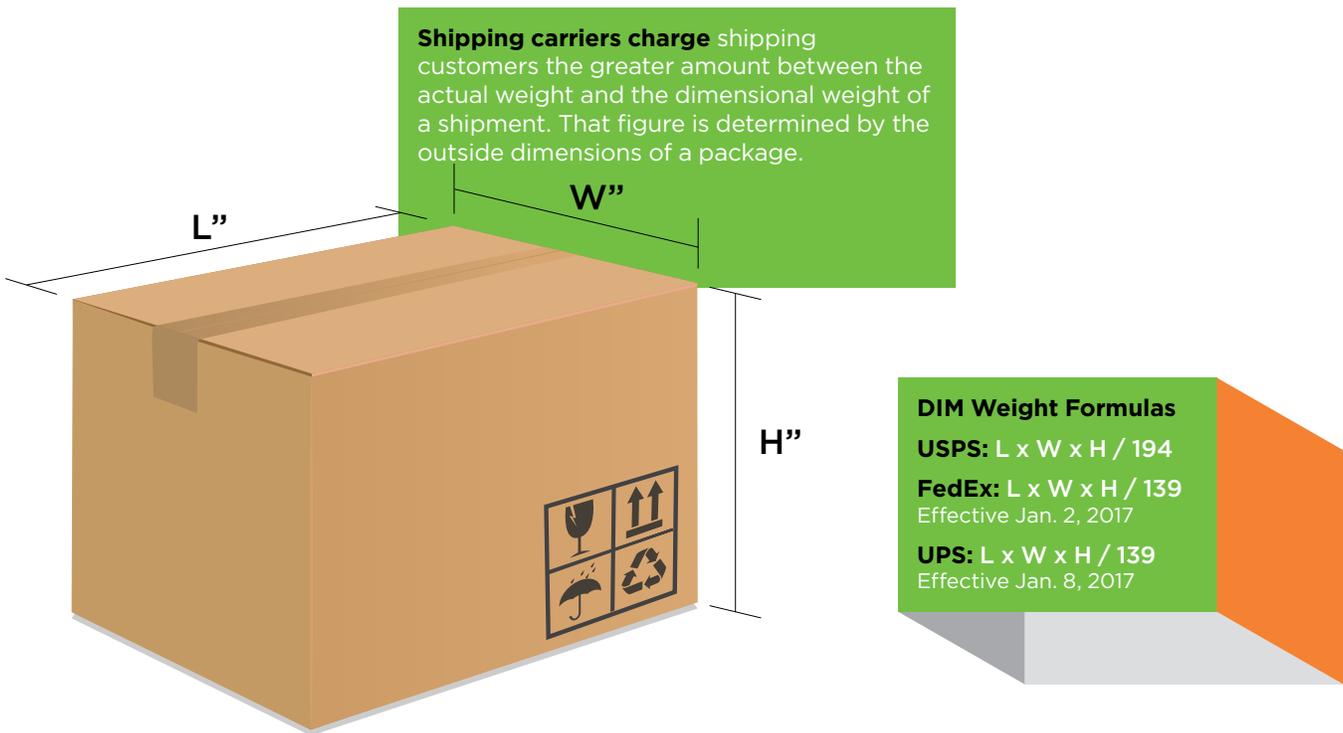
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## Section 2: The DIM Weight Price Calculation Formula.

In essence, the DIM model is based on a formula that establishes a minimum charge for the cubic space a package occupies. Dimensional weight price calculations are comprised of three fundamental components: the size of the shipping box, the box's actual weight and the object inside the box.

The DIM model is based on a formula that establishes a minimum charge for the cubic space a package occupies.



### DIM Weight Formulas.

#### United States Postal Service (USPS):

Length x Width x Height divided by 194, rounded up (Applicable to Priority Mail parcels and packages traveling more than 1,000 miles from their point of origin).

#### FedEx:

Length x Width x Height divided by 139 (Effective 2 January 2017). This will be the third time FedEx has adjusted its formula (previous dividers: 194, 166).

#### UPS: Packages Over One Cubic Foot

Length x Width x Height divided by 139 (Effective 8 January 2017) for all packages over one cubic foot (1728 cubic inches). Packages below this threshold will be subject to the UPS dimensional weight factor of 166.

#### Related Definitions

<b>Actual Weight</b>	How much an object actually weighs in lbs. or kgs.
<b>Dimensional (DIM) Weight</b>	Cubic size of an object divided by a dimensional factor.
<b>Billable Weight</b>	Whichever is greater, actual weight or dimensional weight, is used for invoicing.

### The Economics of Wasted Space.

Today shipping a small or lightweight item in a large box is guaranteed to add unnecessary cost. If dimensional weight exceeds actual weight, the shipping rate will be based on the dimensional weight. The bigger the box—regardless of the contents—the higher the shipping expense. For example, a 12” x 12” x 8” box used to ship small electronics with an actual weight of 1 lb. would have had a dimensional weight of 6 lbs. in 2012. Today, the dimensional weight of that package is 8 lbs., and what would have cost approximately \$12 to ship ground in 2012 will now cost \$14 to \$15.

### Section 3: DIM Weight Effects on Carriers, Shippers and Customers.

#### Dimensional Weight Pricing: A Major Revenue Source for Shipping Carriers.

Larger-than-required boxes for the products they contain cause carrier vehicles to reach volume capacity before they reach physical weight capacity. Dimensional weight pricing should motivate shipping customers to choose the right-sized box for the contents it carries.

#### Manufacturers, retailers and e-tailers are now in the fulfillment business.

Companies typically stock five to 12 box sizes to fulfill most orders, and the box selected for each shipment is frequently left to the packing station operator. Often the item is significantly smaller than the box and consequently requires void fill (air pillows, bubble wrap, etc.), which adds more cost.

The DIM weight model has increased costs for most shippers, triggering the re-evaluation of business processes and the re-engineering of packaging strategies. For example, packaging procedures may be more labor intensive as shippers measure and record the outside box dimensions for each shipment.

Assuming an order will ship at actual weight—versus being shipped in multiple boxes—an oversized box at DIM weight can result in an additional 10%-200% shipping costs. The bottom line? Shippers sending bulky, lightweight packages will pay more than they did before 2015.

**Top 25 Box Sizes and Minimum Billable Weights by DIM Divisor**

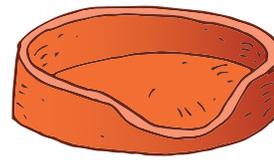
L	W	H	Cubic Inches	2016 Bill Weight	2017 FedEx Bill Weight	2017 UPS Bill Weight
4	4	4	64	1	1	1
5	5	5	125	1	1	1
6	6	4	144	1	2	1
8	6	4	192	2	2	2
6	6	6	216	2	2	2
12	6	6	432	3	4	3
10	8	6	480	3	4	3
8	8	8	512	4	4	4
12	12	4	576	4	5	4
12	12	6	864	6	7	6
10	10	10	1000	7	8	7
12	12	8	1152	7	9	7
12	12	12	1728	11	13	11
16	12	12	2304	14	17	17
18	12	12	2592	16	19	19
14	14	14	2744	17	20	20
24	12	12	3456	21	25	25
16	16	16	4096	25	30	30
18	18	16	5184	32	38	38
18	18	18	5832	36	42	42
18	18	24	7776	47	56	56
24	18	18	7776	47	56	56
20	20	20	8000	49	58	58
22	22	22	10648	65	77	77
24	24	24	13824	84	100	100

Source: PARCEL

AN OVERSIZED BOX AT DIM WEIGHT CAN RESULT IN AN ADDITIONAL

**10-200%**  
SHIPPING COSTS

## Examples of oversized boxes at DIM weight resulting in 10-200% increase in shipping costs.



**63%** OF SHOPPING CARTS ARE ABANDONED AT CHECKOUT DUE TO HIGHER THAN EXPECTED SHIPPING COSTS

### Video Game Controller

Dimensions: 12" x 8" x 8"  
 Actual Weight: 1 lb. (\$8.13)  
 DIM Weight: 6 lbs. (\$10.89)  
 Avg. Rate Impact: **+ 34%**  
 Avg. Monthly Impact (30 days)  
 50 Packages/Day: **+ \$4,140**

### Woman's Purse

Dimensions: 19" x 15" x 5"  
 Actual Weight: 2 lbs. (\$9.10)  
 DIM Weight: 11 lbs. (\$11.94)  
 Avg. Rate Impact: **+ 31%**  
 Avg. Monthly Impact (30 days)  
 50 Packages/Day: **+ \$4,260**

### Medium-Size Pet Bed

Dimensions: 24" x 24" x 10"  
 Actual Weight: 5 lb. (\$10.68)  
 DIM Weight: 41 lbs. (\$26.33)  
 Avg. Rate Impact: **+ 47%**  
 Avg. Monthly Impact (30 days)  
 50 Packages/Day: **+ \$23,475**

SOURCE: Calculations based on 2016 FedEx List rates for Ground service across Zone 5 and DIM divisor 139. Surcharges are not included.

### Three Ways Shippers Have Reacted to DIM Weight Pricing:

1. Comparison-shop among carriers for best prices
2. Utilize carriers that best fit needs
3. Change packaging and operations procedures

### Consumer Reaction to DIM Weight Pricing.

When consumers place items in their online cart, an estimated shipping quote—depending on the speed of delivery (or carrier service level)—is often provided. It's crucial that estimated shipping costs are accurate. If overestimated, cart abandonment increases. If underestimated, shippers incur the additional shipping costs.

Some multi-carrier shipping solutions are powerful enough to be integrated at the shopping cart level. It's important to show your customers real-time shipping rates with the carriers you do business with. This reduces shopping cart abandonment and costs for the shipper. With multi-carrier shipping software, shippers will also be able to offer consumers more options.

### Studies prove that more shipping options drives more sales.

Other positive impacts include meeting customer expectations and shipping deadlines, and shipping to a wider geographical area, which means more customers.

### Section 4: Changing Packaging and Operations Procedures.

The ascent of e-commerce has dramatically increased the number of single-line and complex multi-line orders. For a time, packaging was not a major concern since a steady supply of boxes, void fill and labor could get items out the door quickly.

Shippers are now monitoring packaging more closely because of the DIM weight dilemma. This new attention to packaging is particularly evident in the e-commerce sector where it is imperative for shipping customers to match external packaging to the contents of the shipment. Remember, not every item requires protective packing material. Since the average e-commerce shipper uses just 65% of box capacity, a lot of space goes to waste and a lot of cost is incurred in corrugated material, air pillows, bubble wrap and other void fill materials, labor, and in wasted fuel for trucks that operate under their weight capacity.

AVERAGE E-COMMERCE SHIPPER USES JUST **65%** OF BOX CAPACITY, A LOT OF SPACE GOES TO WASTE

## How to save on shipping costs in response to the DIM weight changes:

1. Review the sizes and weights of the products shipped and right-size the parcel box, especially those that are large and lightweight. Determine if DIM weight will trump the actual weight to determine the cost savings impact.
2. Look at fuel surcharges which are calculated off the base rate. If the base rate is higher due to DIM weight ratings, the fuel surcharge will be higher too.
3. Determine how much DIM weight rating might affect shipping costs, and investigate if lower USPS Priority Mail rates would be a less expensive option.
4. Closely examine the boxes used to ship your products. Many items may be able to be shipped in bags rather than rigid containers. However, bags are still subject to the new DIM weight process.
5. Use multiple carriers—shipping rates vary by carrier. USPS is often the lowest cost for smaller packages going to a residence. UPS and FedEx are great for larger packages delivered to a business. Each carrier provides low shipping cost options for its own niche package weight groups, so make sure to use the right carrier to optimize shipping.
6. Seek “fit-to-size” packaging solutions that will reduce shipping and material costs.

## Section 5: Environmental impact.

### Reducing Environmental Waste.

Many companies, especially those in e-commerce, have reputations for using inefficient, wasteful packaging. Although many companies say they are “green,” they still use oversized boxes with unnecessary void fill. Changing old ways of packaging is difficult because most organizations don’t necessarily view packaging as part of their supply chain.

### Fuel Savings for Carriers.

Dimensional weight reflects package density, which is the amount of space a package occupies on a delivery truck in relation to its actual weight.

Smaller packaging yields less packaging waste equaling more efficiently stacked freight on truck pallets. The DIM weight charge was designed to help carriers drive more revenue by getting more goods on the existing fleet, rather than investing in more planes, trucks and vans to handle increasing parcel volumes.

## How many packages can fit in a UPS truck?

Smaller packaging yields less packaging waste yielding more efficiently stacked freight.



**1 lb. Pillow**  
Box Size = 28” x 20” x 6”

**312**

**PACKAGES**  
FILL UP A STANDARD  
UPS TRUCK



**1 lb. Shoes**  
Box Size = 16” x 16” x 6”

**2,002**

**PACKAGES**  
FILL UP A STANDARD  
UPS TRUCK



### Consumer Responses to Packaging.

Nearly 68 percent of Americans say they are more conscious of packaging materials and design today than they were five years ago. A consumer's response to receiving a thumb drive in a shoebox is important to consider. Oversized packaging upsets consumers who dislike air pillows, bubble wrap and paper with a small item in an oversized box. Thirty-four percent of customers say packaging reflects the retailer's environmental commitment.



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### Section 6: The Formula for Cost Savings and Consumer Delight.

DIM weight is now firmly rooted in the shipping equation. While DIM requirements may be confusing at times—and difficult to compare services and pricing between carriers—there are opportunities to save money so it's important to know what options are available.

The challenge for businesses of all types and sizes, especially those in e-commerce and omnichannel fulfillment, is finding a shipping partner that understands the intricacies of logistics and fulfillment, multiple carriers and customer expectations. Businesses need a shipping partner that provides a complete, customized and configurable solution. Such a partnership will help realize cost savings by optimizing current shipping practices and implementing new packaging technology and software tools. The desired outcome? Ensure each parcel is delivered in the most cost effective box via the most cost competitive carrier—and the fastest method possible.

## Section 7: DIM Weight and Shipping FAQs.

1. How is DIM weight calculated?
  - a. Package Length x Width x Height, divided by a factor unique to each carrier.
2. What are the USPS, FedEx and UPS DIM divisors?
  - a. USPS: DIM divisor = 194, only for parcels traveling 1,000 miles or more.
  - b. FedEx ground and air parcel shipments, DIM divisor = 139.
  - c. UPS Domestic ground and air parcel shipments, DIM divisor = 139 for all cubic packages over 1 cubic foot.
3. Do all packages need DIM weighing?
  - a. DIM weight pricing is typically applied to all packages, though each carrier has its own DIM weight rules.
4. What about international shipments?
  - a. International shipments are subject to DIM weight charges similar to domestic. Both UPS and FedEx have a DIM divisor of 139 for international shipments.
5. What is considered a parcel?
  - a. The USPS defines a parcel as a single shipment less than 70 lbs. Major carriers accept single shipments on their air and ground networks of 150 lbs. or less. A carrier views a higher weight shipment within these thresholds more favorably than 1-10 lbs. shipments.
6. Who uses DIM weight?
  - a. FedEx, UPS, Canada Post, Australia Post and USPS. Royal Mail does not have dimensional weight policies.
7. Which is the best carrier to choose for shipments under 1 pound?
  - a. USPS First Class remains the best option for shipments under 1 pound, and in most cases, USPS Priority Mail the best option up to 70 lbs. This is especially true if you are able to fit your order into one of the USPS flat rate or Regional boxes. The USPS “cubic” rates are also remain an excellent deal if you qualify for Commercial Plus rates.



### About Quadient

Quadient is the driving force behind the world's most meaningful customer experiences. By focusing on four key solution areas including Customer Experience Management, Business Process Automation, Mail-related Solutions, and Parcel Locker Solutions, Quadient helps simplify the connection between people and what matters. Quadient supports hundreds of thousands of customers worldwide in their quest to create relevant, personalized connections and achieve customer experience excellence. Quadient is listed in compartment B of Euronext Paris (QDT) and belongs to the SBF 120 index.

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