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## Retail 2D Transition Frequently Asked Questions

### 1. What is Ambition 2027?

Ambition 2027 is the initiative that drives the global transition from traditional 1D barcodes, like UPC-A barcode, to more versatile 2D barcodes powered by GS1 on retail products by the end of 2027. The 2D barcodes can store much more data, enabling retailers and consumers to access detailed product information, such as batch numbers, expiration dates, and URLs for online resources, which can be accessed through retail POS systems or mobile devices.

This initiative aims to improve supply chain efficiency, enable product traceability, and enhance customer engagement by connecting physical products with the digital world. To make this transition, retailers may need to upgrade POS systems to be able to scan 2D barcodes powered by GS1. The shift will be gradual, with dual marking of products (using both 1D and 2D barcodes powered by GS1) expected throughout the transition period.

### 2. Is Ambition 2027 a retailer date? Can a brand decide not to do it at all?

The global Ambition 2027 timeline has been established to ensure retailers have ample time to get ready for scanning the approved 2D barcodes powered by GS1 for POS. For the brand owners, the decision on timing will be made by the brand. It is the brand's strategic plan that determines when they can/want to make the transition to 2D barcodes powered by GS1. Important to note the transition to 2D barcodes powered by GS1 is optional for brand owners.

### 3. What if a retailer is not ready by 2027 ambition date?

If a retailer isn't ready by December 31, 2027, they may be unable to scan products with only 2D barcodes powered by GS1 at POS. However, according to GS1 General Specifications, the barcodes will include human-readable information (HRI) containing the GTIN, which can be manually entered at POS.

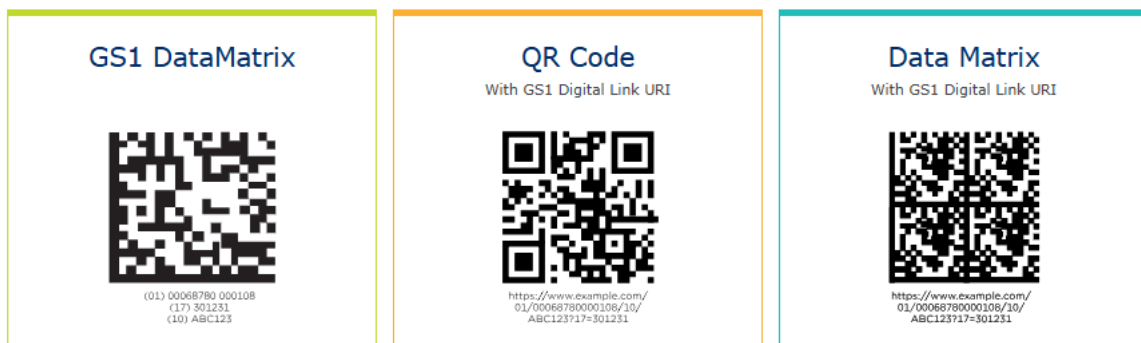
### 4. How significant is this shift to 2D barcodes powered by GS1 for retailers? Is Ambition 2027 feasible?

The impact of the shift to 2D barcodes powered by GS1 varies for each retailer. It depends on the retailers' scanning and Point-of Sale (POS) capabilities. Ambition 2027 is the global industry goal for retailers to process both linear and 2D barcodes at POS by the end of

2027. This goal is achievable if retailers begin assessing their systems and planning for readiness now.

## 5. What are the approved 2D barcodes powered by GS1 for Retail Point-of-Sale (POS)?

The three approved 2D barcodes for retail POS are: GS1 DataMatrix, QR Code with GS1 Digital Link URI, and Data Matrix with GS1 Digital Link URI.



Click [here](#) for more information on each 2D barcode and their capabilities.

## 6. Why 2D barcodes powered by GS1?

The momentum for change, to use more capable 2D barcodes powered by GS1, is driven by industry's need to share more on-pack data and to allow consumer engagement through links to web-enabled information. This is done by encoding the GTIN and supply chain information such as lot number and best before date in a web friendly format, allowing the consumers to access additional information, such as allergens, online. 2D Barcodes powered by GS1 meet the growing information demands of consumers and regulators, enable additional supply chain efficiencies, enable new circular economies and build brand trust by providing more accurate, complete and up-to-date product information, all the while enabling existing POS processes (going beep at the check-out).

## 7. Why should I switch from UPC/EAN (1D) barcodes to 2D barcodes powered by GS1?

1D barcodes, such as EAN/UPC barcodes, are only capable of carrying a product identifier known as the Global Trade Item Number (GTIN). 2D barcodes powered by GS1 can carry additional data, such as expiration date, batch/lot number, serial number, and more. Having this data in the barcode adds value by allowing the information to be automatically captured and acted on. 2D barcodes powered by GS1 enable better solutions for

traceability, supply chain visibility, consumer engagement, recall readiness, waste prevention and others.

Some 2D barcodes powered by GS1, like a QR Code with GS1 Digital Link URI (Uniform Resource Identifiers) additional data while connecting consumers and other users to online resources and experiences. In addition to carrying more data, 2D barcodes powered by GS1 are likely to be smaller than their 1D counterparts and include a built-in error correction feature that add to their reliability.

## **8. What is the difference between GS1 DataMatrix and Data Matrix barcode?**

Whilst both barcodes look the same, the GS1 DataMatrix begins with the special start sequence FNC1. The FNC1 turns a Data Matrix barcode into a GS1 DataMatrix barcode. It tells scanners that the barcode is structured in accordance with GS1 standards and how to interpret the data. A scanner will generate an error message if it is expecting a GS1 DataMatrix barcode, but the product only contains a Data Matrix barcode.

## **9. What is GS1 Digital Link?**

GS1 Digital Link (GS1 DL) provides the bridge needed to connect GS1-based identification schemes with the syntax used on the World Wide Web. In simple terms, GS1 DL provides a standard way of expressing GS1 identification keys and additional data in a format that can be used on the Web while still going beep at checkout.

## **10. Can I remove the linear barcode now to avoid POS confusion?**

The POS linear barcodes such as UPC-A barcode are not going away and the 2D barcodes powered by GS1 cannot immediately be the only barcode on-pack until ubiquitous global scanning of 2D barcodes powered by GS1 is achieved.

Therefore, industry defined a transition period - Ambition 2027 which is the global transition from traditional 1D barcodes, like UPC-A barcode, to more versatile 2D barcodes powered by GS1 on retail products by the end of 2027. This timeline gives supply chain trading partners time to plan for 2D scanning capabilities to process various barcodes at POS and other locations in their facilities.

## **11. Will the transition to 2D barcodes be costly for retailers?**

The cost of transitioning to 2D barcodes powered by GS1 varies for each retailer based on their scanning and POS readiness. Retailers need to verify their scanning and POS capabilities with their solution providers. GS1 Canada provides a test kit for retailers to test and verify their scanner readiness and supports the GS1 Standards related conversations with solution providers, if needed. Please reach out to your GS1 account manager for more

information.

## **12. How ready are the Canadian retailers?**

GS1 Canada is actively working with retailers to raise awareness about Ambition 2027. Many retailers are conducting readiness assessments in collaboration with solution providers to develop their plans for the 2D barcode transition by 2027. GS1 Canada continues to expand outreach to other retailers, associations and solution providers to ensure broader awareness and preparedness.

## **13. Have many brand owners made the transition?**

Some major brand owners have announced plans to adopt 2D barcodes powered by GS1. For national brand products already featuring a QR code, they can begin encoding information using GS1 Digital Link as they update their packaging. The QR code with a GS1 Digital Link URI will use the same GTIN and can point to the same web address.

## **14. Should brand owners work with our customers (retailers) directly or is there a general plan for this?**

The transition to 2D barcodes powered by GS1 is voluntary for brand owners. While retailers worldwide are evaluating their readiness for Ambition 2027, brand owners can begin adding a 2D barcode powered by GS1 alongside existing 1D barcodes on products and collaborate directly with their customers on implementation.

## **15. Do I need to assign a new GTIN to a product when we transition to a 2D barcode powered by GS1?**

No. The same GTIN that is in your linear barcode such as UPC-A barcode must be encoded in the 2D barcode powered by GS1, but the GTIN must be in 14-digit format. You can change a 12-digit GTIN (aka U.P.C) into 14-digit GTIN by adding two leading zeros to the beginning of the GTIN. For 13-digit GTINs, one leading zero is added.

Example:

12-digit GTIN: 068780000108

14-digit GTIN: **00**068780000108

## **16. If the GTIN for the product changes, do we need to create another QR Code with GS1 Digital Link URI for the product?**

Yes, transitioning to a 2D barcode powered by GS1 is independent of GTIN assignment. Each product requires a unique GTIN, and therefore, a distinct QR code with a GS1 Digital Link URI. If a product undergoes changes requiring a new GTIN per the GTIN management standard, a new QR code powered by GS1 must be generated with the updated GTIN.

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**17. Can retailers request expiry dates and other information from brand owners?**

No, they cannot. The choice of which GS1 approved 2D barcode to use and the data encoded within it is solely at the discretion of the brand owner.

**18. Must we print the barcodes at the production line now?**







If you want to encode additional information such as lot/batch number or best before date in the 2D barcode powered by GS1, then yes, the barcodes will need to be printed at the production line (inline printing).

**19. As we update our packaging can we add a QR code with a GS1 Digital Link URI without the GTIN, and add the GTIN later?**

No, a GTIN is required to create a QR code with a GS1 Digital Link URI, as the GTIN serves as the key for product identification. Your products already have a GTIN, which is encoded in your linear barcode. You will need to use the same GTIN, but it must be formatted as a 14-digit number (by adding two leading 0's to the beginning of the GTIN) in the QR code with the GS1 Digital Link URI.

**20. How much space will be required on the package for a 2D barcode powered by GS1?**

The amount of space required for a 2D barcode depends on what type of barcode is used, how much data is encoded, and if any modifications must be made based on the packaging material or shape. The [GS1 General Specifications](#) contains the minimum, target and maximum sizes allowed for 2D barcodes powered by GS1 used on products scanned at retail point-of-sale in [section 5.12.3.1](#). The below table shows barcodes at their minimum and maximum sizes based on the standards defined in the GS1 General Specifications.

Barcode Type	Encoded Data	Minimum Size	Maximum Size
GS1 DataMatrix	GTIN	 (01)09526000134367	 (01)09526000134367
GS1 DataMatrix	GTIN, sell-by date, batch/lot number	 (01)09526000134367 (16)301231 (10)ABC123	 (01)09526000134367 (16)301231 (10)ABC123
QR Code with GS1 Digital Link URI	GTIN	 <a href="https://www.example.com/01/09526000134367">https://www.example.com/01/09526000134367</a>	 <a href="https://www.example.com/01/09526000134367">https://www.example.com/01/09526000134367</a>

Since the size of the barcode depends on factors like barcode type, amount of encoded data, and other variables, there is no one-size-fits-all answer for the exact size to plan for. As mentioned in the FAQ on choosing the right barcode, it is also recommended that solution partners be involved to ensure the barcode design, size, and quality meet the required standards.

To ensure that barcodes meet quality needs, it is highly recommended to adopt a barcode verification program. Verification is a process where the barcode is graded based on standardised parameters to determine the likelihood it will scan correctly. Verification can help companies understand the quality of their barcodes, whether trading partners can scan them, and what needs to be done to improve them.

## 21. Can a QR Code powered by GS1 be hacked?

QR Codes are neither inherently safe nor unsafe. It is the software used to scan them and the user's behaviour that will determine if scanning a QR Code leads to good or bad information. A brand or retailer can help by selecting a domain name that will resonate with and give confidence to the user.

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## 22. Can I remove regulatory data from the label or product packaging when we implement 2D barcodes?

No. You must ensure that your physical label and product packaging is compliant with all applicable laws and regulations set by the relevant government bodies or regulators.

## 23. What system updates are needed to scan 2D barcodes powered by GS1?

System updates will vary based on what equipment is already in place and what use cases need to be enabled. Scanning 2D barcodes powered by GS1 requires an image-based scanner, so those with older laser-based scanners will need hardware upgrades.

If image-based scanners are already installed, you will need to check with your solution providers to see if software updates can be done to scan all approved 2D barcodes powered by GS1 and process the data encoded in them.

Beyond scanner updates, systems that will store and use the data in the barcode may also need updating. For instance, systems may need modifications to stop the sale of an expired product based on the date in the barcode or they may need to be modified to capture and use a batch/lot number to support recalls.

## 24. What are the benefits of 2D barcodes powered by GS1?

- **Brand Owners:** Elevate your brand experience and supply chain efficiency. Next generation 2D barcodes powered by GS1 unlock a unified strategy, allowing you to enhance consumer engagement, streamline supply chains and more
- **Retailers:** Revolutionize your operations and deliver a seamless shopping experience. Next generation 2D barcodes powered by GS1 empower you to boost operational efficiency, improve waste management, recall management and more.
- **Solution Providers:** Lead the innovation in the 2D barcode ecosystem. By offering advanced systems and tools, you can facilitate the transition to next-generation 2D barcodes powered by GS1, positioning yourself at the forefront of industry evolution.