

EVALUATING THE INTERNATIONAL BUILD BACK BETTER FRAMEWORK IN THE POST-DISASTER RECOVERY EFFORT IN CHRISTCHURCH

Isaac Kim

Department of Civil and Environmental Engineering
University of Auckland, Auckland, New Zealand

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Abstract

“Building Back Better” (BBB) first emerged as a recovery concept following the 2004 Indian Ocean Tsunami. It is an integrated, holistic approach to improving the physical, economic, social and environmental conditions of a community throughout post-disaster recovery and reconstruction; ultimately improving its resilience. The framework achieves BBB through eight principles which branch under three core categories. This research study evaluates the New Brighton business sector’s current post-disaster management efforts with respect to the BBB framework. A thorough literature review addressing the fundamental components of this research was carried out in conjunction with a site visit to Christchurch for quantitative and qualitative analysis. Semi-structured interviews were conducted with a range of businesses, non-profit organisations and government related institutions. Analysis of the data collected provided traces of BBB practices integrated in the current recovery procedures of businesses and government institutions which were predominantly in the areas of psychological and social recovery. The major finding was the absence of legislative support and communication between stakeholders, which is what mostly contributed to the inefficiency of BBB in New Brighton. Recommendations for change in accordance with BBB practices have been made to reduce risks and improve the overall resilience of New Brighton’s business sector.

1. Introduction

Statistics from Geo Risks Research Department of Munich (Hoeppe, 2007) show a dramatic increase in the frequency and magnitude of natural disasters over time, resulting in greater destruction of the surrounding environment (Red Cross, 2010). Despite the increasing number of disaster events, traditional post-disaster reconstruction strategies remain inefficient and poorly managed, seeing much room for improvement (Halvorson & Hamilton, 2010).

On the 4th of September 2010, a magnitude 7.1 earthquake struck the Canterbury region, 11km beneath the rural town of Darfield. More than 5 months after the main shock, on the 22nd of February 2011, a magnitude 6.3 aftershock occurred 5km south-east of Christchurch causing catastrophic damage to the city, leaving it in a vulnerable state. The series of earthquakes in the Canterbury region have caused extensive impacts on the social, economic and natural environments in the

Christchurch Central Business District (CBD) and the surrounding suburbs.

New Brighton is a coastal suburb of Christchurch located about 8km east of the city center. New Brighton and its neighboring suburbs experienced severe damage from the earthquakes due to liquefaction and as a result thousands of residents were relocated to different suburbs. The development of red zones isolated New Brighton from the rest of Christchurch which caused major problems in the economic downfall of the suburb.

The concept “Building Back Better” first emerged during recovery efforts following the 2004 Indian Ocean Tsunami (Clinton, 2006) (Lyons M. , 2009), for the purpose to improve traditional reconstruction and recovery methods. Build Back Better has been described as a set of procedures that can be implemented following a disaster to improve the physical, social, economic and environmental aspects of a community by using the reconstruction process as an opportunity (Mannakkara &

Wilkinson, 2016). Build Back Better (BBB) has been further developed into a framework with a holistic approach to post-disaster reconstruction. The international Build Back Better Framework represents key areas in which action need to be taken to build back better (Mannakkara & Wilkinson, 2016); ultimately creating a more resilient community.

This report is the first part of a joint research project which analyses the current state of disaster management, response and preparedness practices in New Brighton's business sector and evaluates them against the BBB principles. It encompasses fundamental information gathered from literature review and reports, describes the methodology adopted for this research as well as discussion around the results from data analysis relevant to the first four principles of the BBB framework.

2. Scope

The scope of this research was restricted to the business sector of New Brighton due to limited time and resources, but also because this research was a part of the ongoing works led by Opus Research and funded by Natural Hazards Research Platform. As a part of their research studies, it was recommended to consider the recovery in New Brighton.

3. Objectives

The primary objective of this research was to examine the current state of New Brighton's business sector to better understand the correlation between the successfulness of recovery and the adoption of Build Back Better best-practices, in-line with the international Build Back Better Framework.

The following sub-objectives were considered to meet the goals of this study:

- a) Understand the BBB framework;
- b) Understand the pre-disaster social and economic status of New Brighton;
- c) Investigate the post-disaster experiences of businesses in New Brighton;
- d) Use the BBB Framework to analyse the post-disaster recovery of the New Brighton Business sector;
- e) Determine BBB best-practices that can be translated to assist recovery planning in the future

4. Literature Review

The literature review mainly focuses on publications on the BBB framework and its principles in order understand

the key concepts in which this research project was built upon. Additionally, reports, articles and journals on the social and economic impacts of the earthquakes were considered as well as recovery master plans.

4.1. Building Back Better

4.1.1. What is Building Back Better?

The post-disaster recovery of a community; physical, social, economic and environmental restoration, is a complex and intricate process. Traditional post-disaster recovery and reconstruction methods consisted of simply repairing the physical damage incurred (Halvorson & Hamilton, 2010). Such methods often focus on rapid restoration of affected communities which poses a risk of replicating, and possibly aggravating, already existing issues. This may be due to non-adherence to design and construction polices for buildings and infrastructure, dominant local government agencies, inconsideration of certain aspects of the recovery process and neglecting vulnerable groups and organizations in the community. It is evident that "rebuilding the built environment and infrastructure exactly as they were prior to a disaster often re-creates the same vulnerabilities that existed earlier" (Kennedy, Ashmore, Babister, & Kelman, 2008).

Build Back Better has been defined "as a way to utilize the construction process to improve a community's physical, social, environmental and economic conditions" (Mannaakkara, Wilkinson, & Fancis, 2014). This means that the reconstruction process is seen as an opportunity to address existing prevalent issues but to also further improve the affected community's physical, social, economic and environmental state. Build Back Better is a holistic approach to, effectively and efficiently, create a more resilient community for the future (Mannakkara, Potangaroa, Safi, & AbuShaaban, 2016).

From prominent documents and guidelines which depict Building Back Better, key concepts proposed to achieve BBB during reconstruction and recovery can be identified and grouped into recovery areas. Categorizing such recovery areas form the 3 Core Categories for Building Back Better:

- Disaster Risk Reduction
- Community Recovery
- Effective Implementation

(Mannakkara & Wilkinson, 2014)

4.2. Key Categories and Principles

International case studies on Building Back Better were conducted, and using the pre-established core categories

and principles for BBB, the Modified Build Back Better Framework was developed (Mannakkara, Potangaroa, Safi, & AbuShaaban, 2016). The Build Back Better Framework, which can be seen in *figure 1*, shows that building back better requires consideration of the three core categories and the eight principles that branch out from them.



Figure 1: The International Build Back Better Framework

4.2.1. Disaster Risk Reduction (DRR)

Disaster Risk Reduction aims to improve disaster resilience in a community by minimizing and/or eliminating risks. Risks can be minimized or eliminated by firstly improving the structural designs and increasing the ability to resist damage during a disaster; ultimately improving the resilience of the built environment and physical assets. Secondly through better hazard-based land-use planning in response to prevalent risks. Thirdly by providing disaster risk reduction education to communities and creating awareness of early warning, disaster preparedness, evacuation and management plans.

4.2.1.1 Principle 1: Structural Resilience

Principle 1 deals with the structural resilience of a built environment. It aims to increase the resistance against natural disasters and ensure the structural integrity of the affected community's built environment. The importance of improving structural resilience is widely understood (Meigh, 2009) (McCurry, 2011), but in practice, is less frequently attained due to the poor enforcement of regulations, lack of time and resources and the quality of workmanship. BBB aims to address these common issues by revising and enforcing building codes and regulations as well as construction standards (Mannakkara, 2014).

4.2.1.2 Principle 2: Multi-hazard based Land-use Planning

Insufficient consideration of land-use planning after a major disaster event may give rise to unnecessary

additional vulnerabilities and risks. (Clinton, 2006) states in his BBB propositions that "recovery efforts should, at minimum, ensure that communities become safer than they were before the disaster". This backs up the BBB theory that along with structural resilience improvements, better considerations of multi-hazard based land-use planning is to be implemented to ensure future risks are minimized (Mannakkara, 2014).

4.2.1.3 Principle 3: Early Warning and DRR Education

(Clinton, 2006) states in his third key proposition for BBB that "Governments must enhance preparedness for future disasters". Providing DRR education to communities creates awareness of early warning systems, preparing communities for disasters by informing them of evacuation and management plans. It can be seen that Early warning and DRR education is crucial to reduce the risks faced by communities living in disaster prone areas (Project Child, 2017).

4.2.2. Community Recovery

Community recovery aims to support the overall recovery of the community by firstly implementing support for psychological and social recovery in order to assist the community with re-establishing their lives. Secondly through regenerating and rejuvenating the community's economy by helping businesses recover, facilitating the return to traditional livelihoods, and introducing new economic opportunities.

4.2.2.1 Principle 4: Psychological and Social Recovery

It is obvious that the impact of a major disaster on the psychological and social aspects of a community is less noticeable than the physical damages to the built environment. For this reason, it is common to overlook the psychological and social state of affected communities. However, these aspects of a community can have significant impacts on its overall recovery (Kristensen, 2012) hence, it is crucial to consider solutions to psycho-social issues when implementing Building Back Better. Principle 4 aims to address these issues by increasing community support through initiatives such as personalized support personnel and specialized assistance for vulnerable community groups. Furthermore, it aims increase community involvement through collaborative recovery planning and implementation of recovery projects that accommodate full transparency with affected communities (Mannakkara, 2014).

4.2.2.2 Principle 5: Economic Recovery

It is evident that along with damage to the built environment, a disaster event causes damage to a community's economy. Damages include the "disruption

of businesses and industries resulting in other problems such as high inflation rates and poverty (Mannakkara, 2014). For this reason, it is clear that the damage to a community's economy can have adverse effects on the overall recovery, slowing the process down significantly (Colten, Kates, & Laska, 2008). Principle 5 aims to accommodate recovery through implementation of tailor made economic recovery strategies as well as introducing initiatives that integrate the necessary funding, training and job opportunities to affected communities (Mannakkara, 2014).

4.2.3. Effective Implementation

Effective Implementation aims to enable reconstruction and recovery to progress in an effective and efficient manner by firstly establishing an institutional mechanism that is fitting for the local community and is able to coordinate the recovery process. Secondly by using appropriate legislation and regulation to enforce BBB-based practices and to improve efficiency of critical processes. Thirdly by utilizing monitoring and evaluation mechanisms to not only maintain but to also improve the recovery processes for the future.

4.2.3.1 Institutional Mechanism

Principle 6 refers to the systems or social structure put in place that govern the behavior of affected stakeholders. "Post-disaster institutional mechanisms need to ensure speed and quality in the rebuilding efforts whilst facilitating co-operation and collaboration between stakeholders to produce a unified outcome" (Mannakkara & Wilkinson, 2016). The institutional mechanism adopted should, not only take into consideration stakeholder and community needs, but also incorporate good co-ordination, close communication and overall balance.

4.2.3.2 Legislation and Regulation

Thoughtful consideration and implementation is essential in the reconstruction/recovery procedures following major disasters. Such procedures should aim to not only minimize further disruption to those affected by a disaster, but also enhance the development of resilient communities (Mannakkara, 2014). The use of disaster management-based legislation and regulations may be necessary to ensure the efficiency and effectiveness of implementation of recovery procedures (James Lee Witt Associates, 2005) (Castro & Keipi, 2006).

4.2.3.3 Monitoring and Evaluation

The efficiency and effectiveness of post-disaster reconstruction procedures is essential to the overall state of recovery (Mannakkara, 2014). It is crucial to be able to assess how well such procedures are being

implemented through monitoring and evaluation mechanisms. Principle 8 aims to facilitate long term evaluation and monitoring schemes to ensure effective recovery that complies with BBB best practices.

4.3. Social and Economic Impacts of Earthquakes on Christchurch

As a result of the 2010/2011 earthquake series, numerous buildings were severely affected predominantly unreinforced masonry buildings. Majority of the damage was caused by ground shaking as well as ground deformation (including liquefaction, uplift, subsidence and tilting) (Potter, Becker, Johnston, & Rossiter, 2015). A variety of Christchurch's built environment and infrastructure was critically damaged including residential housing, health care and schooling facilities, the CBD, iconic landmarks and heritage buildings. It is evident that the aftermath of the Canterbury Earthquake sequences has not only had a large impact on the physical aspects, but also the social and environmental aspects of the city. The earthquakes have impacted individuals, families, social groups, businesses and the wide community as a whole (Potter, Becker, Johnston, & Rossiter, 2015).

According to (Stevenson, et al., 2012) of the Canterbury organizations that were affected by the September 2010 earthquake, "64% were forced to close at least temporarily. At least 1% of those businesses were closed permanently. This increased to 11% because of the February 2011 earthquake". Business sectors that were severely affected included tourism, small businesses, and service industries such as retail, wholesale trade, hospitality, international education and aged care (CERA, 2015) (Stevenson, et al., 2012). Furthermore, businesses within the Christchurch CBD and surrounding suburbs were affected differently due to a number of internal and external factors including community connectedness, relocation of residents and businesses, and recovery trends in surrounding areas (Potter, Becker, Johnston, & Rossiter, 2015).

4.4. New Brighton Master Plan

The New Brighton Centre Master Plan was prepared as a response to the significant damage caused to the commercial centre in New Brighton. The purpose of this plan was to help direct land and business owners in the redevelopment of the centre and to attract private investment whilst also setting a potential framework for public expenditure (Christchurch City Council, 2015).

The framework used for the development and implementation of the plan follows five themes which are based on the Integrated Recovery Planning Guide,

prepared by the Canterbury District Health Board and the Council. These themes include:

- Economy and Business
- Movement
- Natural Environment
- Community Wellbeing/Culture/Heritage
- Built Environment

The themes mentioned above are broadly aligned with the Earthquake Recovery Strategy prepared by the Canterbury Earthquake Recovery Authority (CERA). Considering the framework and the themes that provided a foundation for the master plan, a comparison can be made with the International BBB Framework to identify any improvements that could be made; to ultimately improve the resilience of the New Brighton’s commercial centre.

5. Methodology

Before data collection took place, an in depth literature review was carried out on the BBB framework and the pre-disaster/post-disaster status of Christchurch. This was done in order to understand key concepts in which this research study would be based around. Furthermore, whilst waiting for the ethics approval, a relationship was formed with the team from Opus Research, who provided guidance and support for this study.

5.1. Data Collection

Participants were chosen from a directory of businesses and organisations in New Brighton and were initially directly approached through email and phone calls. Those who showed interest were provided with further information about the research study and were eventually asked if they would be available for an interview.

A combination of qualitative and quantitative data was collected during a site visit to Christchurch between the 1st and 5th of August 2017. 20~30 minute semi-structured interviews were conducted with participants and questionnaires were also given out to be filled in for participants that did not have time for the an interview. The mixture of both quantitative data obtained from the questionnaires and the qualitative data that was obtained from the interviews resulted in an enriched and comprehensive data set. Questions were carefully designed using the BBB framework as a foundation.

A wide range of businesses from different sectors were approached during the data collection process including restaurants, retail stores and non-profit organizations. The New Brighton Saturday Seaside Market was also approached where stall owners provided information about the current status of New Brighton. Additional interviews were carried out with representatives from the

Christchurch City Council and Development Christchurch Limited who provided valuable information about the recovery process from a different perspective.

5.2. Data Analysis

The interviews were transcribed word for word and sent back to participants who wished to review and edit the transcription files. Participants had the opportunity to clarify or change the points made in the interview if required. Once necessary changes were made to the interview transcripts, data obtained from both the interviews and questionnaires, was carefully categorized under the BBB principles. Validity of the information provided was ensured through a triangulation process where findings were cross-verified with findings from other participants and documents. Additionally, no information was shared between participants to maintain reliability and validity of the findings of this research study.

Participants were grouped and coded in the format outlined in *table 1* and are referred to throughout this report by their code name.

Table 1: Profile of interviewees

Interviewee Number	Organization	Type	Code
1	New Brighton Library	Community	P1
2	Grace Vineyard Church	Community	P2
3	New Brighton Project	Community	P3
4	Phad Thai	Cuisine	P4
5	Pierside Café and Bar	Cuisine	P5
6	Happy Feet Shoe Repairs	General	P6
7	Bin Inn	General	P7
8	Christchurch City Council (CCC)	Government	P8

9	Development Christchurch Limited (DCL)	Government	P9
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6. Results & Discussion

6.1. General

It was found that shortly after the earthquake series, Christchurch City Council (P8) drafted up an ‘aspirational plan’ for the recovery of New Brighton’s commercial centre. Not long after the council had “signed the plan off” the CCC created a development agency called Development Christchurch Ltd (P9) who were given a mandate to implement the master plan. Since the development of DCL, the Christchurch City Council maintain over-sight of implementation processes.

With heavy reconstruction procedures and projects happening in Christchurch’s CBD, a large number of the New Brighton community feels as if they have been “left out” with some local business owners such as P6 stating “It’s almost as if they’ve put a big black circle around us and said, don’t worry about that place”. However, it was obvious that the reason behind the slow recovery rate of the suburb was not solely because of the lack of implementation projects happening in the suburb, but because of a combination of numerous other factors.

From the findings, it was evident that New Brighton was already experiencing a general systematic decline, even prior to the 2010/2011 earthquake series. New Brighton was once a thriving business hub which had the distinction of being the only area in Christchurch where general retail stores were permitted to open on Saturdays. However, since the introduction of nationwide Saturday and seven day trading in the 80’s and 90’s, activity in the suburb significantly decreased.

6.2. Build Back Better

The findings from the obtained data, analysed against the first four principles of the BBB framework are as follows.

6.2.1. Principle 1: Structural Resilience

New Brighton and its neighbouring suburbs had been impacted to varying degrees due to liquefaction, lowering of ground levels and increase of the water table. Although buildings in New Brighton’s commercial core were “relatively unscathed” it was found that buildings in the commercial core had experienced a varying degree of damages. P7 stated that they had to significantly shrink the size of their shop due to the inability to restore the

damage caused by the neighbouring building collapsing onto theirs, whereas, P6 stated that “this shop has been remarkably well built. We just picked up all the stock and everything was fine”. *Figure 2* shows that 50% of business owners experienced moderate levels of structural damages and 35% of owners experienced extreme damages.

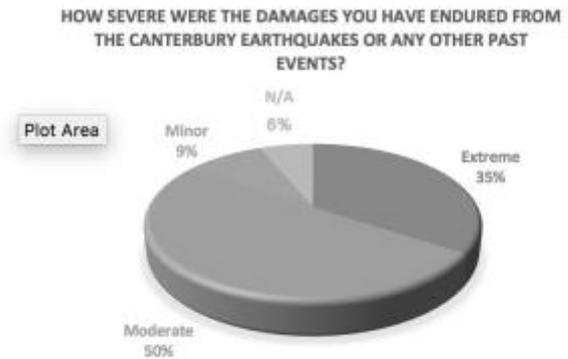


Figure 2: Severity of damages endured by business owners

When business owners were asked the question, “Have there been any measures put in place to improve the physical/structural resilience of your business to natural hazards following the Earthquakes?” 56% of owners said that there were no measures put in place and 44% of owners said there were some kind of measures put in place.

P8 stated that one of the main challenges in trying to implement further measures to improve the structural resilience of New Brighton’s commercial core would be the cost. It was also stated by P9 that since the earthquakes, a particular natural hazard provision around floor levels has come out which was backed up by a statement from P8 saying, “if there were to be further development, for flood reasons, the floor levels would be required to be higher”.

From the obtained results, it can be seen that there is still much room for improvement in terms of enforcing regulations to increase the commercial core’s resistance against natural disasters. However, it was evident that there are numerous issues in implementing such changes. One of them being that, in such slowly developing suburbs, it is extremely difficult to find investors (both public and private) who are willing to pay the price to improve the structural resilience of the built environment.

6.2.2. Principle 2: Multi-Hazard Based Land-use Planning

New Brighton, being a coastal suburb, is a high risk zone compared to other suburbs in Christchurch. The implementation of red zones and the decrease in population of the surrounding areas due to relocation have put more pressure on those who have decided to remain. However, despite the difficulties it can be seen that majority of the New Brighton Community would not consider relocation as an option. When asked the question “Would you consider relocating to a lower risk location within New Brighton?” 69% of business owners replied that they would not consider it. Furthermore, when asked if they would consider relocating to a lower risk suburb out of New Brighton, 70% of business owners replied that they would still not consider relocation as an option. This was backed up by P8 stating that “relocation is always going to be an option but my understanding is, the local community wants local businesses because it’s good for the area. They want the shops and things like that”.

The CCC have plans to reduce the area of New Brighton’s commercial core however, the reasons for this change in land use is not to reduce disaster risk but to concentrate the commercial core to benefit the local economy. Perhaps BBB principles could be incorporated into such plans to integrate the ideas behind multi-hazard based land-use planning in future implementation processes.

6.2.3. Principle 3: Early Warning and DRR Education

Based on the findings, it was evident that minimal early warning and DRR education was directly provided for businesses in New Brighton. Although majority of businesses owners had a good understanding of the risks associated with the natural hazards which were most likely to strike Christchurch, P5 states that they have to “rely on common knowledge” in the case of a natural disaster event. When asked the question, “Have you received any information and/or informal/formal training to assist you with facing risks and hazards?” 67% of business owners answered no.



Figure 3: Assistance received to help face risks and hazards

However, it is clear that there are council led programmes that facilitate information to the general public on relevant disaster related issues and evacuation plans. The reason why there is such a high percentage of people that claim to have not received any information may be because of a lack of personal interest. In order to raise awareness of early warning systems and increase community preparedness of natural disasters, a potential option could be to organize public workshops or information evenings where the communities are invited to discuss the issues around natural disasters, risks, evacuation and management plans.

6.2.4. Principle 4: Psychological and Social Recovery

Analysis of collected data showed that 67% of New Brighton business owners felt like they were not receiving the support needed to overcome the social/psychological barriers that are affecting them following the earthquakes. However, P6 stated “you’re talking hundreds of thousands of people that were in shock for quite a long time. I wouldn’t expect people to come door knocking every one of those households to make sure that people are okay. It’s just not realistic”.

Regardless of the many barriers that New Brighton’s community were up against, the overall recovery of the local community appeared to be relatively effective. Local non-profit organizations such as Grace Vineyard Church and New Brighton Project played a large role in the restoration of the community by providing ongoing support and organizing events where the community could feel a sense of belonging.

Start-up projects like the Saturday Seaside Markets run by New Brighton Project and “Tiny Huts” run by the Transitional Cities Programme (now called Enliven Places) are prime examples of successful projects that helped bring the community together by providing a space where people could go and enjoy the company of each other in their own environment. The people of New Brighton have a strong community spirit and show a lot of pride and passion towards the suburb. The suburb has a lot of character and it could be seen that initiatives such as the seaside market were suited around the already existing strengths and weaknesses of the community in order to catalyze its social/psychological recovery.



Figure 4: Saturday seaside market

7. Limitations

Although all efforts were made to ensure this research study was carried out to the best of abilities, there were some limitations that may have hindered the quality of the outcome of this study.

Firstly, the sample size was limited due to a lack of time and resources during the weeklong site visit to Christchurch. Furthermore, due to the busy schedules of participants, interviews were limited to approximately 20~30 minutes. This meant that there were questions that were not asked to some participants. Also, the study was limited to one sector of New Brighton i.e. Businesses. If further time and resources were available, it could be worth considering more than one sector to make comparisons and identify the similarities and differences between sectors.

8. Conclusions

The best practice post-disaster recovery efforts of New Brighton's business sector were examined through a combination of qualitative and quantitative analysis, against the eight principles under the three core categories of the International BBB framework. The aim of this analysis was to determine the successfulness of recovery of New Brighton's business sector. Also, to assess its resilience to natural hazards and disaster events and ultimately to recommend BBB based improvements to enhance resilience and future recovery planning. This report is part one of a two-part report and addresses the first four principles of the BBB framework.

The findings from this research study show hints of BBB concepts in particular areas of the recovery efforts made in New Brighton's Business Sector. However, such

efforts clearly fall short of reaching the standards that are required to truly BBB.

The recovery efforts in New Brighton with respect to Principle 4: *Psychological and social recovery*, displayed outstanding performance through the integration of community based support and initiatives that proved to catalyse community recovery. However, recovery efforts with respect to Principles 1 through to 3 did not come close to satisfying the requirements, clearly lacking the systematic implementation of enforcing regulations, integrating multi-hazard based land-use planning and providing early warning and DRR education.

There is hope that this research will lead to further research and ultimately be taken into consideration by both public and private stakeholders of the business sector of New Brighton. Despite the many difficulties and barriers that New Brighton's community and teams that are working towards its recovery are facing, there is confidence that New Brighton will be able to build back better through collaboration and close communication.

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